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ABSTRACT

This issue of the IATUL (International Association of Technological University Libraries) Proceedings provides an overview of interlending and document delivery in a number of countries. The document comprises: (1) "Interlibrary Lending in the United Kingdom" (Maurice R. Line); (2) "Interlending and Document Delivery in the Federal Republic of Germany" (Helmut Drubba); (3) "Interlending in the German Democratic Republic and the Technological University Libraries" (Dieter Schmidmaier); (4) "New Developments at the Center for Research Libraries" (Donald B. Simpson); (5) "Requesting Periodical Articles with the Netherlands Union Catalogue/Interlibrary Loan System: NCC/IBL" (Huub van de Gein); (6) "Problems and Trends in R&D Information Supply in Denmark with Special Considerations on Interlending and Document Delivery Developments" (Annette Winkel); (7) "Interlibrary Lending in Sweden" (Ulla Daehli Martins and Nancy Fjallbrant); (8) "A Proposed Model for Interlibrary Lending in China" (Liu, Songfu); (9) "The CEC's (Commission of the European Communities) Role in the Promotion of Electronic Document Delivery in Europe" (Carlo Vernimb); (10) "Online Retrieval and Electronic Delivery of German Patent Information" (Gerd Tittlbach); and (11) "TRANSDOC--An Electronic Document Transmission Project at C.D.S.T. (Scientific and Technical Documentation Centre)" (Jacques Soule). (THC)

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Interlending and Document Delivery

edited by Nancy Fjällbrant

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Interlending and Document Delivery

edited by Nancy Fjällbrant

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EDITORIAL

The ever growing volume of published information, particularly in science, technology and medicine, has led to a situation where no library can be self-sufficient in its literature holdings. At the same time the development of online bibliographic information retrieval services and improved telecommunication access, have greatly increased the possibilities for finding references to documents of potential interest. No longer can the information needs of library users be met directly from the local store, material must be obtained from external sources. This has resulted in greater emphasis on interlibrary lending and document supply and efforts to improve these activities.

This issue of IATUL Proceedings provides an overview of interlending and document delivery in a number of countries with articles from the United Kingdom, the Federal Republic of Germany, the German Democratic Republic, U.S.A., Holland, Denmark, Sweden and the Peoples Republic of China.

The issue concludes with an outline of the role of the Commission of the European Communities in the promotion of electronic document delivery in Europe with brief descriptions of 10 projects in the areas of electronic document delivery and/or electronic publishing. The need for an appropriate transmission system is pointed out, together with a brief outline of the APOLLO project based on the use of the second European Communication Satellite. The final two articles are descriptions of two of the CEC supported projects - the online retrieval and electronic delivery of patent information from the Federal Republic of Germany, from Fachinformationszentrum, Karlsruhe and the TRANSDOC electronic document transmission project of the Centre de Documentation Scientifique et Technique of the Centre National de Recherche Scientifique, Paris.

Nancy Fjällbrant

INTERLIBRARY LENDING IN THE UNITED KINGDOM

Maurice B Line

British Library Lending Division, Boston Spa, Wetherby, U.K.

Introduction

The interlibrary lending system in the United Kingdom differs in fundamental respects from that in any other country in the world, in that supply is much more highly centralized *. It is evident that interlibrary lending, however efficiently it is planned and managed, can by itself do no more than supply what is already held; a truly effective national document supply system must include provision as well as supply, that is, it must ensure that documents likely to be wanted are acquired. The UK is not the only country that aims at a national acquisition system - the Federal Republic of Germany has had one for some years, and Sweden, Norway, Finland and France have embryo systems or advanced plans; but in the UK alone acquisition in support of other libraries is concentrated almost entirely on one library, the British Library Lending Division. There are several cooperative acquisition schemes in the UK, but they all deal with minority areas. There are also other interlending schemes, but according to a survey carried out in 1977³ the British Library Lending Division handled over three quarters of all interlibrary demand from British libraries, and supplied 70 % of requested items from its own stock (Figure 1).

The high degree of centralization means that it is relatively easy to collect good data on interlibrary lending in the UK. The figures collected regularly by the British Library Lending Division have been supplemented in recent years by statistics gathered by the regional systems. Information on the 14 % or so of demand that is not handled either by the Lending Division or by the regional systems is much harder to collect, and to date only the 1977 survey gives a total picture. Figures 2 and 3 present further information from this survey. It seems likely that since 1977 the proportion of demand coming from academic libraries has gone down a little and that from 'other' (chiefly industrial and government) libraries has gone up, but the general picture is probably still accurate. (Another national survey is to be carried out in 1985). More data from the 1977 survey are given later.

* This paper deals only with the current position, not with the history of interlending in the UK. Two very useful articles on interlending up to and after 1945 have appeared recently.^{1, 2}

FIGURE 1:

Sources of interlibrary document supply in the UK (1977)

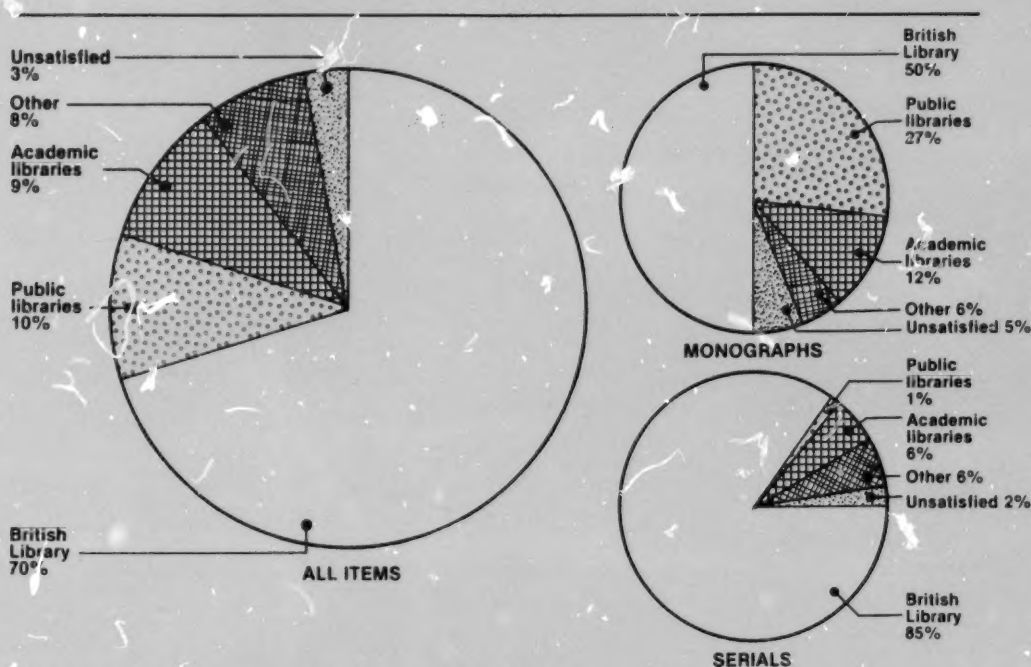
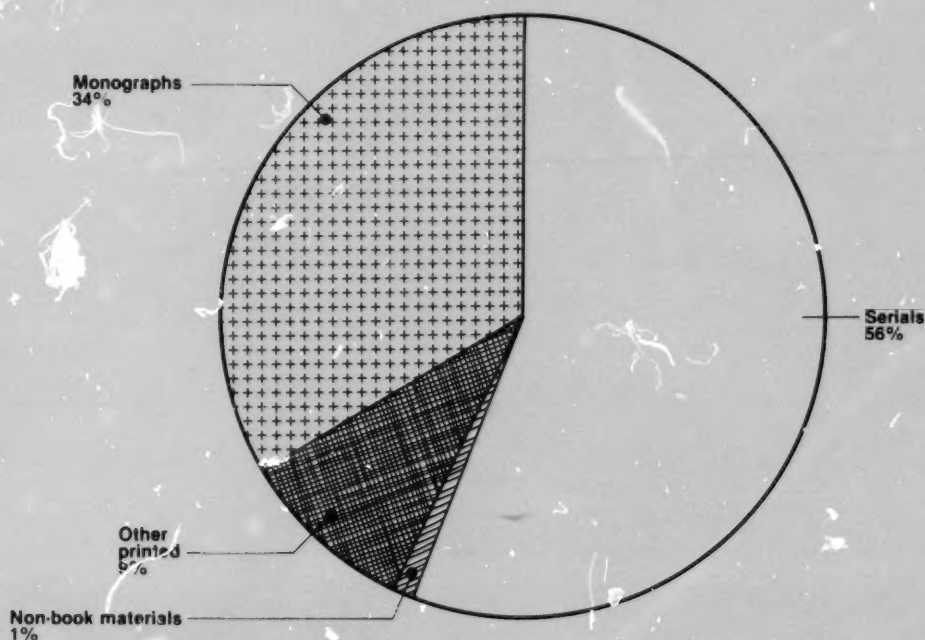


FIGURE 2:

Forms of material requested in the UK (1977)



BEST COPY AVAILABLE

The British Library Lending Division

The British Library Lending Division owes its main origins to the fact that interlibrary supply in the UK in the 1950s, though it did not compare at all badly with other countries, was considered inadequate, both in the number of requests that could be satisfied and in the speed of supply. The National Lending Library for Science and Technology was created to provide a rapid service from a central stock, much of it taken over from the Science Museum Library; initially this was restricted largely to scientific and technical journals, English-language and Russian books, and report literature, but its coverage gradually broadened, and when the National Central Library was amalgamated with it in 1973 on the formation of the British Library the combined institution - the British Library Lending Division - had a very wide-ranging acquisition policy, which has changed little since then⁴. The aim is to acquire, in advance of demand as far as possible, those categories of material that are most in demand, and also some material that although not in great demand is required nationally and is not available elsewhere in the UK. The former categories include high-use serials, irrespective of subject or language, and English-language books above a certain level. The latter include other serials, again irrespective of subject or language, report literature, official publications, individual music scores and translations.

Current statistics are shown in Table 1. The justification for buying high-use material, most of which is acquired by numerous other libraries in the UK, is that they are unlikely to be able to supply it quickly, partly because it may be in use locally or very recently acquired, partly because their primary function is to serve their own users. Inevitably a relatively small part of the Lending Division's collection accounts for a high proportion of demand, especially in the case of serials, where 80 % of serial demand falls on only 7,600 of the 56,500 current and 115,000 'dead' titles⁵; demand is more evenly distributed among monographs and other materials. It should be noted however that if costs of acquisition are related to uses, low-use serials do not always compare very unfavourably with high-use serials, which are generally much more expensive. In April 1984 the collection occupied 84 miles of shelving; in addition there were 3 million items in microform. Most of the stock is housed in purpose-built accommodation.

The collection's special strengths are in scientific and technical serials (partly because the Lending Division has longer back runs of them than of most humanities and social science serials), report literature and conference proceedings. The collection of monographs is less complete, if only because they are much harder to select in advance of demand, and there is a much greater chance that items will slip through the net, even if (as is the case with non-British English-language monographs) blanket orders are used. There is also less chance that they will be supplied immediately when requested, since many of them attract a heavy demand, which cannot all be satisfied without very extensive duplication;

FIGURE 3:

Sources of interlibrary requests in the UK (1977)

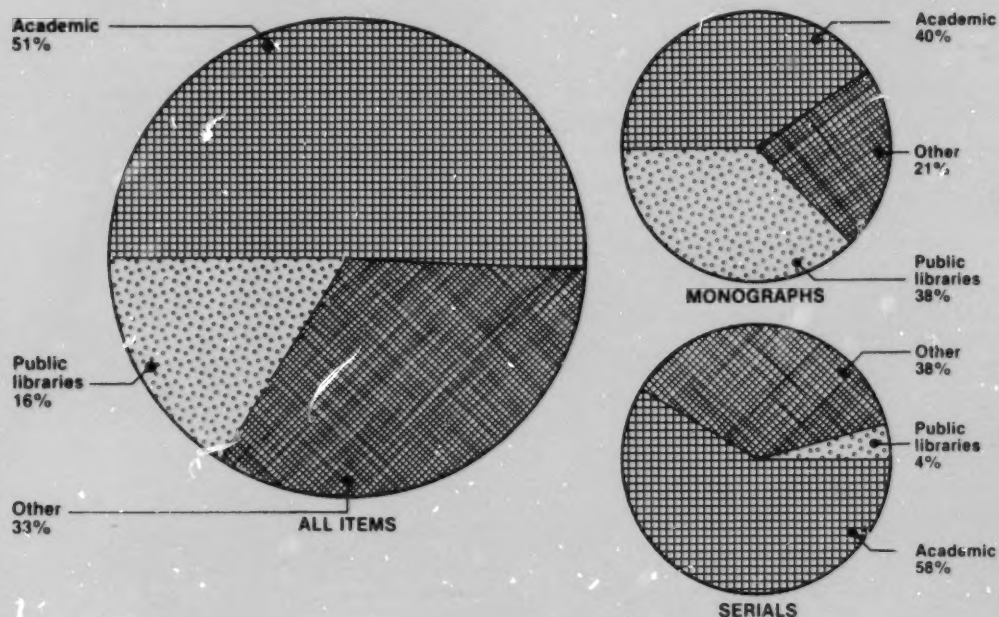


TABLE 1:

Holdings and annual intake of material at the British Library Lending Division (April 1984)

	Holdings	Annual Intake
Serials	172,000 titles	56,500 titles
Monographs	2,498,000 volumes	53,500 volumes (excluding donations)
Reports in microform	2,515,000	100,000
Dissertations	390,500	5,500
Music	76,000	8,000 (including donations)
Conference proceedings*	184,500	19,500
Translations*	495,000	11,000

*Figures relate to items indexed: many of these items are included also in other categories.

extra copies are acquired in response to demand, but they often take some time to arrive, and in any case the period of heavy demand is often a short one.

The collection of dissertations requires a comment. All US dissertations issued by University Microfilms were acquired for some years until financial restrictions, and a sharp rise in their cost, combined with their relatively low use, led to their cancellation. Microfilms of doctoral dissertations of nearly all British universities are made by the Lending Division, with the major exception of the University of London, which has supplied copies of its own theses since 1981. As for official publications, British official publications - including publications of government departments that are not published by HM Stationery Office, and also local government publications - and publications of international organizations such as the United Nations and its specialized agencies and the European Communities are acquired as comprehensively as possible.

Although the Lending Division's collection is particularly strong in more recent publications, not only does it have (as noted earlier) very extensive back runs of many serials, but it has a very large if somewhat haphazard stock of older material, mainly monographs, mostly acquired by donation or by disposal by other libraries of works no longer wanted. Both the NCL and the British Library Lending Division have always accepted such material and added it to stock unless sufficient copies are already held, thus helping to ensure that 'last copies' are not lost to the country and that they are made more readily and widely available. A significant proportion of requests for older material - pre-1945 and even pre-1900 - can be satisfied from this older stock.

The great bulk of demand, not only on the Lending Division but in the UK as a whole, falls on the main acquisition categories. It would be impossible, as well as grossly uneconomic, for the Lending Division to acquire everything. Categories of material it does not acquire systematically include foreign language monographs, 'lower level' English-language material, fiction, play sets and orchestral and vocal sets, maps, and non-book materials. The Lending Division's involvement in these categories ranges from selective acquisition, mostly in response to specific demands, through provision of means of access to alternative sources of supply, to support for other systems where appropriate. For example, foreign language monographs acquired by selected libraries (selected because they all have a substantial intake of such items) are recorded in the Lending Division's Union Catalogue of Books⁶; if locations are not found there or in one of the 'back up' libraries (see below), and if the items in question are in print, they are acquired for stock. The UCB also gives access to older English-language monographs published before the acquisition policy aimed to cover them. There is also a Union Catalogue of Music to supplement stock. 'Lower level' English-language monographs, which were until recently acquired in response to demand, can usually be located in the union lists compiled by the regions; these lists, containing the ISBNs of books and coded library locations, are

integrated by the British Library into a single file, which can be consulted at the Lending Division. The Lending Division has aided the production and publication of a union list of orchestral sets ⁷, and has plans to do the same for vocal sets. The provision and supply of non-book materials present special problems ⁸, and the Lending Division has devoted funds and staff effort to trying to find a reasonable solution.

The UCB, mentioned above, was originally the main means by which interlibrary lending requests for monographs were dealt with until the British Library Lending Division came into being, when it was rationalized and restricted in coverage and came to occupy a supporting role to the Lending Division's own stock. Also in 1973 plans were made to bring into the nation's interlending system major libraries that had hitherto made little or no contribution to it: the legal deposit libraries (the National Libraries of Scotland and Wales, the Bodleian Library, and Cambridge University Library, as well as the British Library Reference Division), the London Library, the Royal Society of Medicine, the British Library of Political and Economic Science (the library of the London School of Economics), and some others ⁹. It was recognized that these would generally have to restrict use of original items to the borrowing libraries' premises, but many of these were invaluable elsewhere in the UK, and in any case they could satisfy many requests by photocopies. These back up libraries now handle more requests than are dealt with by the supply of locations obtained from the UCB and other union lists. (See Figure 4) The main burden is borne by Cambridge University Library and the British Library Reference Division, which not only supplies many photocopies but will now lend selectively in a few limited fields (oriental works and scientific books).

The growth of demand on the central system has been dramatic; Figure 5 shows the picture from the first full year of the NLLST. The decline between 1978/79 and 1981/82 is attributable to the economic recession; in the latter part of 1981/82 demand stabilized and has since then increased quite rapidly. In 1983/84 the Lending Division received 2,196,000 requests from 5,670 UK organizations. Some of this growth has been at the expense of the regional systems (see Figure 6) and direct requesting between libraries, but much if not most of it is due to the uncovering of a large amount of demand that had remained latent because of the inadequacies of the previous system. It is estimated that in the UK as a whole demand rose by a factor of four between 1966 and 1980.

The largest proportion of UK demand on the British Library Lending Division comes from academic libraries (Figure 7), followed by industrial and commercial organizations, government libraries, and public libraries (which use the regional systems first). (According to the 1977 survey, the British Library Lending Division supplied 78 % of satisfied requests originating in academic libraries, 37 % in public libraries, and 74 % in other libraries). Over three-quarters of demand is in science and technology (Figure 8); this reflects the relative amount of research literature published, and indeed the relative

FIGURE 4:

Outcome of requests to the British Library Lending Division (1984)

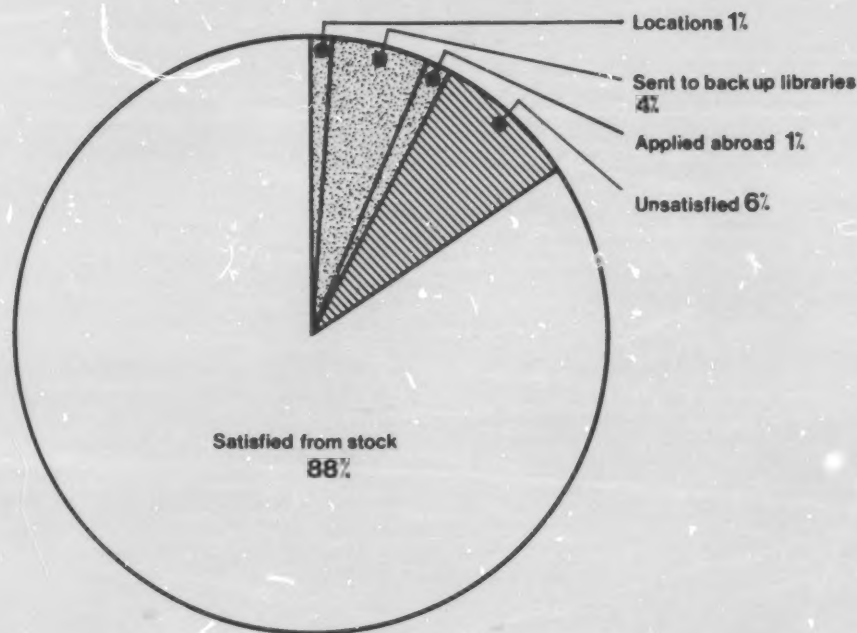
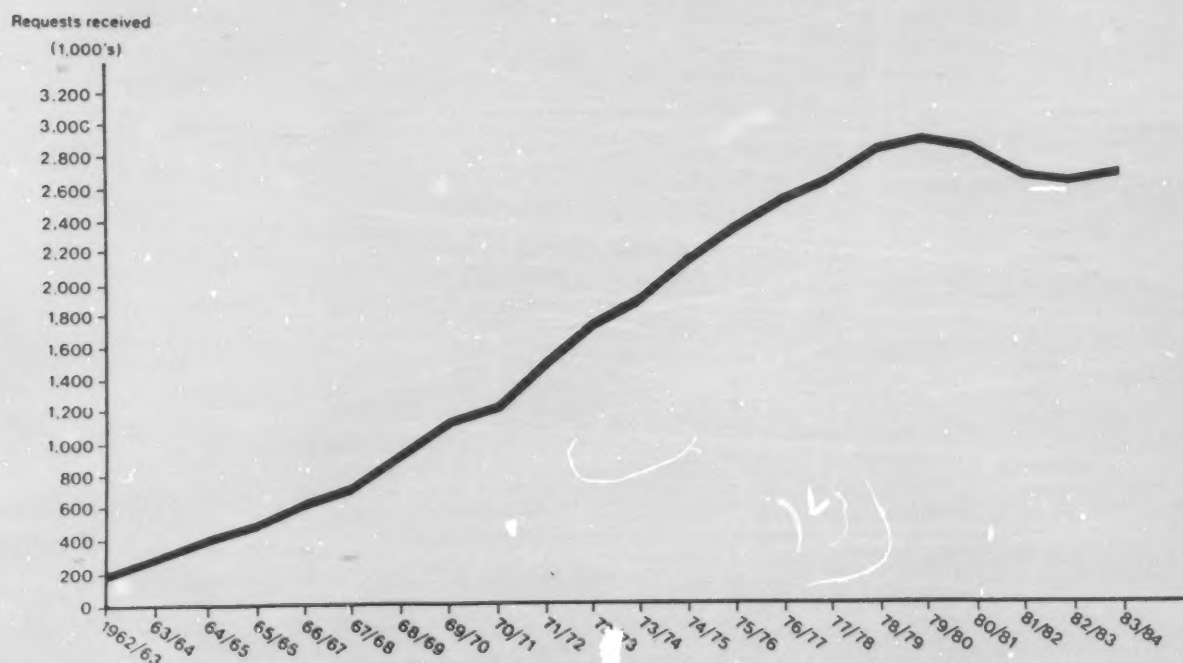


FIGURE 5:

Volume of demand received by the British Library Lending Division and its predecessors, 1962/63-1983/84



Note: the data for 1962/63-1972/73 are for the combined demand on the NLLST and NCL

FIGURE 6:

Relative trends in UK interlibrary demand on British Library Lending Division and regional systems, 1973/74-1983/84

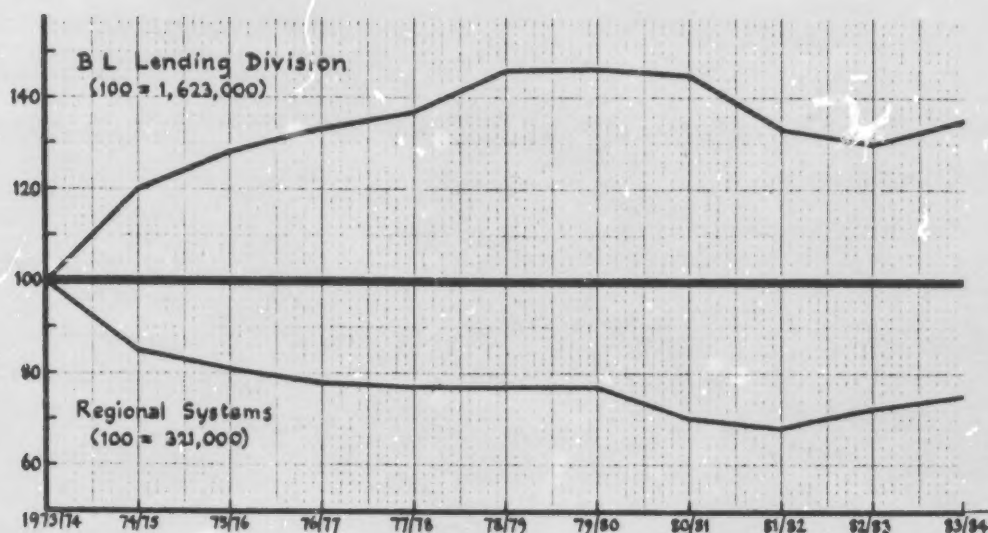


FIGURE 7:

Sources of UK interlibrary requests sent to the British Library Lending Division 1984



amount of research conducted, in different fields. Serials account for 72 % of demand, and monographs for 19 %; these figures compare with 56 % and 34 % respectively of total interlending demand in the UK (Figure 2). About 90 % of all literature requested is in English.

The performance of the system can be seen in Figure 4.¹⁰ It should be noted that the chart does not include requests that have to be returned to the requester because the details are inadequate or inaccurate; most of them are subsequently sent to the Lending Division again and included in the figures. 89 % of serials are supplied from stock compared with 85 % of monographs, 87 % of conferences and only 67 % of other materials. Total satisfaction rates are overestimated by some 2 % or 3 %, since only about 70 % of requests supplied with locations or sent abroad and 50 % of requests sent to back up libraries are actually satisfied. It should also be noted that some of the unsatisfied requests are unsatisfiable, since it is doubtful if the items to which they refer have actually been published; they may, for example, have been referred to prematurely (not all works said to be 'in press' see the light of day), or they may be classified reports from industry or government.

All requests have to be made on prepaid forms, which cover the full average direct costs of supplying items; if items are supplied by other libraries these receive the payment instead by sending the completed forms back to the Lending Division and having them replaced by new ones. The Lending Division pays back up libraries their full average direct costs (which are higher than its own, for obvious reasons).

Most requests are still received by mail, but a quarter come by Telex and other means¹¹ (Figure 9). Requests can be sent direct by computer or through data-base hosts such as DIALOG. The Urgent Action Service, for which extra payment is made, receives requests by telephone, gives a rapid positive or negative response, and if the item is available dispatches it the same day. A still faster (and more expensive) service can be given by the use of telefacsimile for sending copies of articles.

One major development in the last ten years has been the growth of alternative transport schemes to the mail¹²; these are managed by regions (see below), but most were planned or encouraged by the Lending Division, which also operates an interregional scheme. These transport schemes, which save a great deal of money both to the Lending Division and to other libraries, now account for 60 % of items dispatched from the Lending Division.

The procedures in use at the Lending Division have been described elsewhere¹³. They differ markedly from those used by traditional libraries; in particular, all serials and most monographs are shelved alphabetically by title, to speed retrieval and dispatch. Only

FIGURE 8:

Subjects of material requested from the British Library Lending Division (1984)

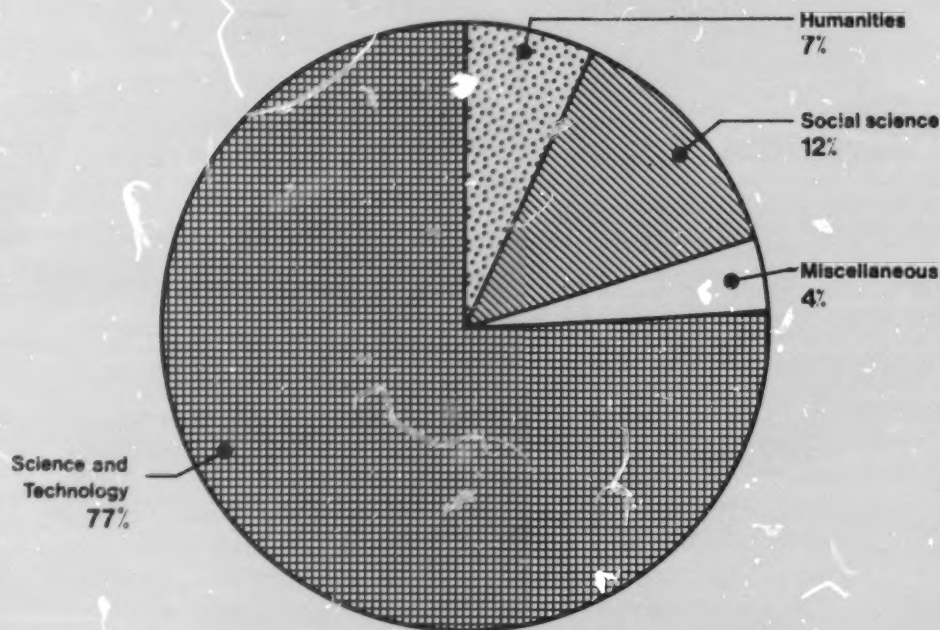
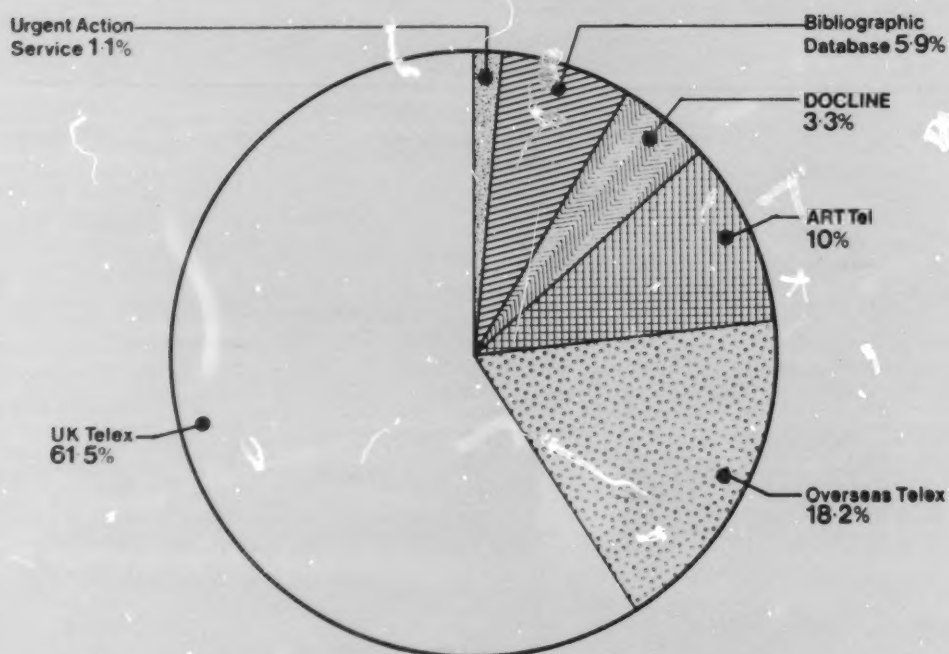


FIGURE 9:

Non-postal methods used to send requests to the British Library Lending Division (1984)



minimal records are kept of stock and of loans. In spite of this, it has proved useful to produce and publish lists and bibliographies of serials^{14, 15}, conference proceedings¹⁶, and reports, translations and theses¹⁷.

Records of the monographs held by the Lending Division have never been accessible outside the Lending Division, but a report of a national committee in 1982¹⁸ recommended that they should receive the same exposure as was being given to the holdings of other libraries, whether by the published ISBN lists or by the de facto union catalogues created by cataloguing cooperatives. Accordingly all Lending Division monograph imprints dated 1980 or later are being recorded in machine-readable form, with a view to being publicly accessible at the beginning of 1985. They are also being recorded on the ISBN lists. Automation of the records of other libraries' holdings included in the UCB will follow^{19, 20}.

The storage of actual documents in electronic form, which would open up a whole new range of possibilities, is under continuous review. Except for the British Library's own publications, it cannot be done without the cooperation of publishers, some of whom at least would like to have the cooperation of the Lending Division. Discussions that started with the ADONIS consortium of publishers three or four years ago have been revived in the hope of mounting experimental schemes involving a limited number of journals; and it is hoped to participate in the European Communities satellite transmission project APOLLO and the UK teletex system HERMES.

Although this paper is concerned with interlending in the UK, a brief comment on the British Library Lending Division's international service is desirable²¹, since nearly a quarter of its demand now comes from abroad (576,000 requests in 1983/84), and it is estimated that between half and two thirds of all international loan and photocopy transactions in the world are handled by the Lending Division. The international photocopy and loan services are spin-offs from the UK service, in that the stock and system developed for UK purposes can equally serve other countries. Charges are approximately twice as high as for UK libraries. It is an indication of the effectiveness of a central collection and supply system that so many foreign libraries - well over 6,000 in all - turn to the Lending Division, often before using their national systems.

The Regional Systems

There are nine regional systems in Great Britain^{22, 23}: seven in England, one in Wales, and one in Scotland. Members include virtually all public libraries, for which they normally serve as a first resort after local stock, a good number of academic libraries, and some others. The English and Welsh regions are essentially cooperatives, with membership based on subscription, usually according to the size of population served in the case of public libraries, and on flat-rate fees (which vary between regions) in the case

of other libraries. The Scottish system is based on and managed by the National Library of Scotland, which incorporated the Scottish Central Library and its stock of 100,000 volumes in 1974, soon after the NCL came into the British Library; there are no subscriptions, and in effect all Scottish libraries are members, reporting their holdings to the Scottish Union Catalogue. In addition to these systems, there is one that covers Ireland, both Northern Ireland and the Republic of Ireland, which operate as one for interlending purposes.

Each English and Welsh region has a Regional Library Bureau, located in a major public library except for LASER, which has its own accommodation, and Wales, where the National Library houses the headquarters. Only the Yorkshire and Humberside Region has a central bookstock, and the regional systems function mainly as switching centres. The bureaux maintain the union catalogues, in particular the ISBN lists mentioned above; these lists, which are held on the computer and produced in updated versions every two months on computer output microfiche, are now by far the main means of locating items within regions.

The volume of demand varies widely, from over 200,000 a year in LASER to fewer than 60,000 in Wales. Although the total number of requests recorded in regions is over a million a year, the majority of these (60 %) come to the British Library Lending Division, and only 22 % are satisfied within the region in which they occur; 11 % are satisfied by other libraries, located by the combined ISBN list or by the British Library Lending Division; and 7 % are unsatisfied²⁴. Most requests are made on Lending Division prepaid forms, thus ensuring that borrowers pay suppliers. Demand in the regional systems fell between 1973/74 and 1981/82, then began to rise again, until in 1983/84 it represented 75 % of its 1973/74 level.

The transport schemes operated by regions have already been mentioned. Some regions are not able to support economic schemes - for example, Scotland, Wales and South-West England, large areas within which libraries are widely scattered; and one region, the East Midlands, has only a partial scheme.

The activities of the British Library Lending Division and the regional systems are coordinated by the National Committee on Regional Library Cooperation. This body, which meets only twice a year and has no executive authority, nevertheless fulfils a valuable function in promoting understanding and cooperative activity. One of its most useful products was a report on the future pattern of interlending²⁵, which looked at the relative roles of the Lending Division and the regions. It found that they largely complemented one another: the regional systems handled requests for material with which the Lending Division did not deal, such as fiction and non-book materials, while the Lending Division was the main source of supply of serials, reports and (through its union

catalogues) foreign-language books. There is only one major area of overlap, recent English-language monographs; for these items two systems are highly desirable, because of the very heavy demand for some items and because the copies held by local libraries are liable to be worn out and become unavailable in a few years. Other issues studied by working parties or sub-committees of the NCRLC include the supply of non-book materials and of material for ethnic minorities.

Other Interlending

It is known from the 1977 survey³ that about 14 % of all interlibrary loan requests go directly to other libraries. The proportion is much higher for report literature and other printed material (38 %) than for monographs (13 %) or serials (10 %). Special libraries accounted for 51 % of successful direct applications, and for 46 % of items supplied as a result of direct application; for academic libraries the respective figures are 39 % and 34 % respectively. The great majority (83 %) of requests received by special libraries and over half (54 %) of those received by academic libraries came by direct application.

It seems clear that much direct application is between special libraries, and that much of it is for report literature, presumably produced by the organizations to which application is made. There is also a good deal of direct application between academic libraries; some of this will have been for serials located in union lists, chiefly the now defunct British Union Catalogue of Periodicals, while some of it will have been speculative. Since 1977 it has become increasingly possible to locate monographs and other material in the computer files produced by the cataloguing cooperatives, and one would expect the amount of direct requesting for monographs to have risen while that for serials should have fallen.

Some direct requesting takes place locally, as part of the activities of local cooperatives^{23, 26}. There are a fair number of these, ranging from the very active to the moribund; for many of them interlending is the main though not the only function, and some of them maintain union lists of serials. The total volume of interlending activity in them is not known, but the potential advantages of same-day supply in cases of urgency and of low visible (though probably high hidden) costs are obvious.

As with regional interlending, much direct requesting uses Lending Division prepaid forms, which serve as a kind of national interlending currency.

Union Lists

The UCB at the British Library Lending Division has been mentioned earlier, as have the regional ISBN lists and the Combined Regional ISBN List and, in passing, the British Union Catalogue of Orchestral Sets. The creation of the British Library Lending Division and its extensive acquisition policy led to a reassessment of union lists, and not only to a radical restriction of the coverage of the UCB but to the demise of the long-established British

Union Catalogue of Periodicals. This was expensive to maintain, and after consultation with the library community it was agreed to be no longer necessary as a current tool. It was succeeded by Serials in the British Library, produced at intervals by the British Library Bibliographic Services Division to serve the current awareness, selection and cataloguing needs of libraries. It contains records of titles newly acquired by the British Library and also by 18 other libraries in the UK, selected on the grounds of coverage and geographical spread, so that it can be used in cases where consultation rather than borrowing is desired.

It might be supposed that libraries would welcome a reduction in union cataloguing, both because union catalogues are much less easy to use than a central supply source and, especially, because they require the active and continuing cooperation of contributing libraries. Surprisingly, an attempt to estimate the number of active or recent union catalogues in existence in the UK led to the identification of well over 100* - and it is unlikely that the list is complete. Some of these are local (eg a Union list of periodicals in libraries in the Brighton area) or cover a relatively small area (eg a list compiled by the Hereford and Worcester Association of Technical Libraries). Some are highly specialized (eg Southeast Asian periodicals, Chinese local histories). Some are both local and specialized (Glasgow list of medical periodicals). No information is available on their use, let alone their cost-effectiveness, though in some cases (eg incunabula in Oxford libraries) such criteria are obviously inapplicable. Some are clearly bibliographies first and union lists second (eg Methodist union catalogue, the Kent bibliography). Several are obviously useful as union lists for locating material, such as the afore-mentioned British Union Catalogue of Orchestral Sets; these materials were previously very difficult to locate. What can safely be said is that, despite the large number of union lists, very few can be considered as in any way major or to perform a quantitatively significant part in interlibrary supply; and it remains true that union lists have diminished greatly as a means of access to library materials in the UK. They may have something of a resurgence as cataloguing cooperatives produce files that serve as de facto location tools, though these will be consulted on-line rather than being published as union lists.

Relative Performance of Alternative Systems

To compare the performance of the British Library Lending Division with that of the regional systems and direct requesting is not exactly to compare like with like, since, as has been shown, they tend to deal with rather different kinds of material. Moreover, the latest relative data on speed come from the 1977 survey³, and are therefore somewhat out of date. As might be expected, the best performance in terms of speed in the first day or two after requesting was achieved by direct application, followed by use of ISBN lists and

* I am indebted to Betty Smith, Bibliographic Research Officer at the British Library Lending Division, for providing this information.

regional bureaux, since at that time it was not possible to receive a reply from the British Library the same day, let alone obtain the actual item wanted. After four days the British Library drew well ahead in speed; for example, on the seventh day nearly 70 % of requests to the British Library had been satisfied, compared with just over 50 % for direct application, 33 % for ISBN lists, and 29 % for regional bureaux.

The costs of interlending using different channels were calculated in a special survey carried out at the end of 1981²⁷. The picture is a complex one, but the conclusion was clear: the total national costs of obtaining items from the British Library Lending Division were substantially lower than via other channels. When other supplying libraries charge for loans or photocopies the costs to requesting libraries are considerably higher than when they obtain them from the Lending Division; and when they do not charge supplying libraries incur heavy costs.

These heavy costs do not take into account the acquisition and accommodation costs at the Lending Division. However, nor do they take into account the costs that would be incurred - in the construction, maintenance and use of union catalogues, in cooperative acquisition schemes, and so on - if an effort was made to attain a similar satisfaction rate by alternative means, which in any case could not achieve a comparable speed of supply. The average direct cost of handling a request at the Lending Division was £1.99 in 1983/84, and the average cost including acquisitions and binding but not overheads was £4.05. It is likely that when there is a high volume of demand, as there is in the UK, it is actually cheaper to handle most of it from a central collection than by cooperative means.

Conclusion

If a similar pattern of demand exists to that shown in the 1977 survey, the total volume of interlibrary demand in the UK in 1983/84 was between 2.80 and 2.85 million: that is, about 50 requests per 1,000 population. It is impossible to compare this ratio with other countries, since they have even less accurate figures for total interlibrary demand, but it seems to be as high as in any other country in the world.

While there is no overall control of interlending in the UK, there is good coordination of interlending involving the British Library Lending Division and the regional systems, which together account for the bulk of requests. The transport schemes involve both the Lending Division and the regions, and the Lending Division loan/photocopy request form is used even for much direct interlending. Certainly the British Library Lending Division is the largest interlibrary supplier in the world, if one excludes specialist institutions like the US National Technical Information Service; and the faith that translated the concept of a centralized system into reality would appear to have been fully justified. Changes will undoubtedly occur, but there are no signs that the basic system is likely to need substantial revision in the near future.

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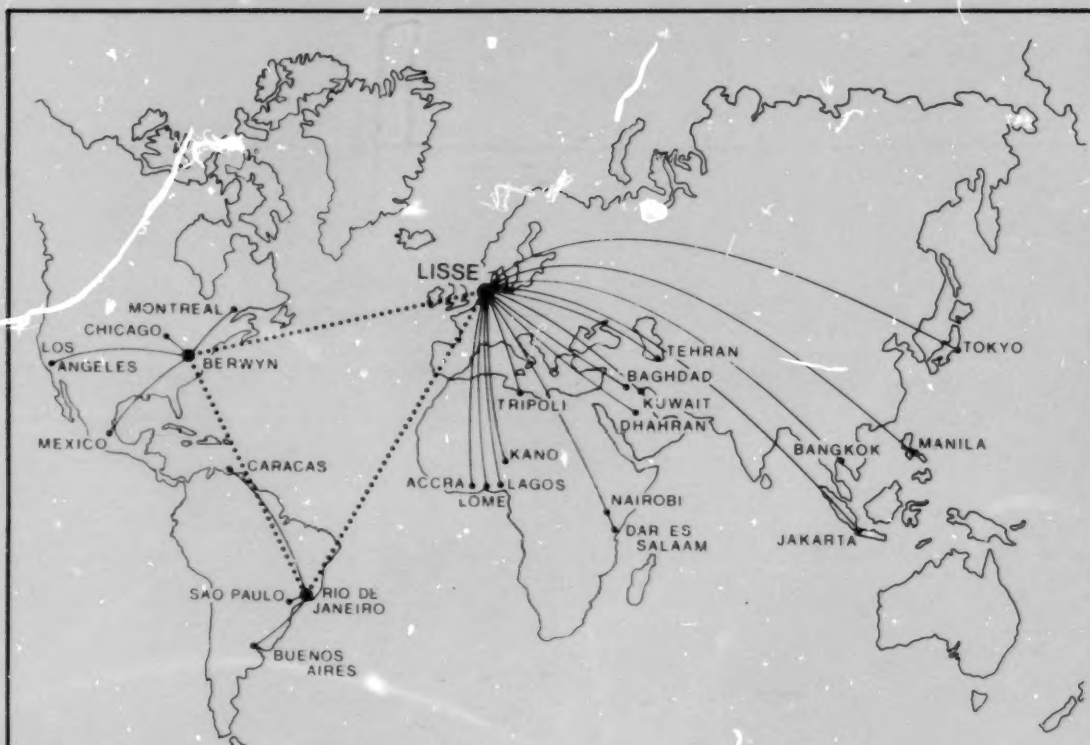
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INTERLENDING AND DOCUMENT DELIVERY IN THE FEDERAL REPUBLIC OF GERMANY

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Introduction

In this article the emphasis will be on interlending and document delivery for the literature of technology and its basic sciences. The interlibrary lending (ILL) system of the Federal Republic of Germany is an operation of a surprisingly large magnitude, with several million transactions each year. In many of the research libraries in the Federal Republic the ILL department handles several tens of thousands outgoing and incoming requests annually.

Alan Singleton, in a study commissioned by the Commission of the European Communities, says in his introductory remarks, 'the current document delivery scene in West Germany, particularly that related to interlibrary loans, is the most complicated of all the members states (of the European Communities) - there is mixture of structure and lack of structure, of strict rules not always obeyed, and of federal, regional and mixed systems with some overlapping responsibilities. Where there are difficulties, it is often fairly easy to see historical, political and geographical factors at work, factors which make otherwise logical solutions very difficult to implement in practice'.¹¹

The historical factor just mentioned is the fact that there was never a single unified German state and that there is none today. The Reich (founded in 1871) was a federation which comprised princely states of great differences in size and power, the most important being Prussia. Education and schools, universities and their libraries, archives and museums were within the responsibility of the individual states (today called 'Länder'). This federal principle (the cultural autonomy of the Länder) was a consequence of the political situation after 1871 and remained significant for the universities and their libraries. Nothing was basically changed during the time of the Weimar Republic. The federal structure of German educational policy explains why there has never been a real German national library, such as the Bibliothèque Nationale in Paris. The Prussian State Library in Berlin (now in East Berlin) assumed in part such a function. Hence there is no 'national legislation' for libraries and this can lead to a wide range of services, standards,

and procedures. These are the political facts. - The geographical facts are that the Federal Republic is a fairly small country: the largest distance North-South is only 876 km while the largest distance West-East measures 425 km. This facilitates a well developed postal, transport and communication system with rapid delivery rates.

Some other factors could be mentioned though these do not very much affect technological university libraries with their demand for more current literature: deficiencies of stock for foreign literature published during World War I and for some years after that, disregard for foreign literature during the Nazi regime, and in particular large scale destruction during World War II. The separation of Germany into East and West and the ensuing cut-off of practically all library ties between the two countries are still sadly felt.

The German Interlibrary Loan System

This system depends on a network of seven regional union catalogues (Zentralkataloge) located at Berlin, Hamberg, Göttingen, Cologne (Köln), Frankfurt, Stuttgart and Munich (München). Over 500 libraries are in the German ILL system, they report their holdings and new acquisitions to their respective regional union catalogue and each library gains access to the library resources of the nation from any type of library (in the ILL system) via the regional union catalogues. The union catalogues are large scale operations with many millions of catalogue cards held by each individual centre.

Admission to the ILL system is gained by application to the respective ministry for education in the Land (the name of these ministries is slightly different in each of the Länder; e.g. it is Ministerium für Wissenschaft und Kunst (Ministry for Science and the Arts) in the Land of Lower Saxony). In order to gain approval a library must undertake to be willing to supply, as well receive, items in the system and report the holdings and new acquisitions to the centre. Relatively few industrial libraries are included. The system is basically free - no charges for loan and postage. For periodical articles, photocopies are also provided free of charge, up to twenty pages (as a rule 0,50 DM per page over 20 pages). The participating libraries use red ILL forms; therefore, the system is sometimes called the redcard system.

In addition to the regional system there are four central libraries (the year of establishment in parentheses)

- (1) Technische Informationsbibliothek in Hannover (TIB)
Technical Information Library (1959)
- (2) Zentralbibliothek der Landbauwissenschaft in Bonn
Central Agricultural Library (1962)

- (3) Zentralbibliothek der Wirtschaftswissenschaften in Kiel
Central Library for Economic Sciences (1966)
- (4) Zentralbibliothek der Medizin in Cologne (Köln)
Central Medical Library (1969).

The largest of these is the TIB. These libraries also take part in the free ILL system and their holdings are also in the respective union catalogues. But these libraries also offer a direct order service for which the user, however, has to pay.

These central libraries were established due to efforts of the German Research Society (Deutsche Forschungsgemeinschaft) and with financial (initial) support from that body. The German Research Society serves the arts and humanities and the sciences by funding specific research projects, by promoting co-operation between research workers and by supporting young people beginning research; it fosters links between science and industry and represents German academic and research interests internationally. It has no research institutes of its own. The German Research Society is not a public corporation or a government institution but has the legal status of a registered company. Its headquarters are in Bonn - Bad Godesberg. The German Research Society receives its funds from the Federal Government and the Länder and also from private sources. The total budget in 1982 was about 900 mill. DM. The part allocated to the library section of the German Research Society is comparatively small; it amounted to about 18 mill. DM in 1982.

This section has been very influential in providing funds in order to help to improve academic libraries as a whole by funding projects which serve libraries across regional boundaries and which are not financed adequately, if at all, from other sources. The German Research Society does not, as a rule, provide funds on a continuing basis though the acquisition of foreign literature (the former Sondersammelgebietsplan) is one exception.

The library section of the German Research Society cannot be regarded as a central library authority with directive powers though much can be initiated by providing (or not providing) funds and, therefore, a certain influence can be exerted.

The four central libraries mentioned above dealt in 1977 with about one third of all ILL requests. - Some difficulties arise from different stages of development of each library, the financing procedures and the tie (subordination) with other (parent) institutions. The four libraries, however, cooperate as far as possible, for example in the acceptance of order forms of other central libraries and the direct delivery of the requested literature. Recently a union list of periodicals of these libraries (and a few other relevant libraries) has been issued as a COM fiche (called ZAG - 3).

The Structure of the German ILL System in Some More Detail

As mentioned before the basic structure depends on the central catalogues maintained in seven locations. Within the redcard system, document location procedures are governed by the ILL rules (*Leihverkehrsordnung*, dated 1979). Basically, these require that a location should first be sought locally; then, if not found, regionally, then nationally etc. This procedure is to be undertaken, even if it is known that the item is held by a library at a remote location, (unless, in the case of borrowing from one of the four central libraries with special subject responsibilities, the requester is sure that it is not held locally). Although this rule is meant to improve the system operation by helping to prevent the overloading of libraries with large collections, it is not surprising that it is not always followed and that requests are sent to remote libraries without first checking exhaustively locally. And it is also obvious that such a multi-tiered structure causes delays which could accumulate to many days and weeks in delivery time for the customer.

A number of bus-routes are maintained in various regions of the Federal Republic by which books (and photocopies) are transported from one library to the other and there are a number of transfer points where the material is transferred to buses (these are, in fact, delivery vans) of another route.

The magnitude of the ILL traffic (by buses and by post) is rather large and it seems that the amount handled in individual libraries (in particular the research libraries) has dimensions which have no parallel elsewhere in the world. Detailed statistics are kept in each library and these are published annually as 'Deutsche Bibliotheksstatistik' by Deutsches Bibliotheksinstitut in Berlin.⁷ Part B deals with research libraries (*Wissenschaftliche Bibliotheken*). These statistics are available in about July for data for the preceding year.

An indicator for the magnitude of the German ILL traffic is the number of outgoing ILL requests. Top of the list for 1983 is the University Library Göttingen with 55,005 requests sent out; this, in fact, is a slight decrease against 1982 when this number was 58,403. This is followed (for 1983) by Giessen with 50,429, Münster 43,733, Mainz 43,709, Aachen 41,677, Bochum 41,707, Erlangen 41,000, Osnabrück 40,140, and Frankfurt 39,140. It could be mentioned that Göttingen constitutes the third largest library in the Federal Republic.

It is felt in many quarters that these figures are much too high, each outgoing request representing a deficiency in stock which could not meet an immediate demand locally. One way out would be much higher purchase of books and periodicals at each individual library, but financial restrictions make this a very unlikely possibility. It should also be born in mind that a much larger intake would mean more staff for cataloguing and other work and, of course, larger buildings for housing the additional intake.

There have been discussions on charging (either the individual requester or the requesting library), not so much for recovering costs but thereby making readers and/or libraries cost-conscious. In the present system there are no charges for the reader or the library sending out ILL requests. According to an estimate (dating back to 1978) by Tehnzen and Jacob⁴ the costs incurred by one ILL request are at least 15.-- DM (or about £4.00 or \$5.00). It should be mentioned that in some of the Länder (but not in all) libraries have been ordered to charge a token fee of about 1.00 DM for each outgoing or filled ILL requests but this, of course, does not give a clear indication to the reader (or requester) of the actual costs involved.

No financial transactions or compensations from one library to another are effected on, say, an annual basis. The redcard ILL system is basically free and it rests on the assumption that in the end some sort of balancing is achieved. The reality, however, is quite different and there is an inevitable imbalance that exists in systems of this sort, i.e. some libraries give (lend or provide photocopies) considerably more than others. For a free system this clearly means that some participants are subsidizing others, and that there will be reluctance to embark on any new system which aggravates this imbalance - for example, an unconstrained electronic ordering system.

The imbalance is particularly felt at the central libraries mentioned above. UB/TIB Hannover sent out 13,189 ILL requests in 1983 but it received 336,900 requests of which 39 % came via the redcard system and photocopies etc. were supplied free of charge.

On the other hand the main complaints of readers and libraries alike are the unpredictability of delivery time, and, in fact, the average time to wait for an item to arrive (or failing to arrive). A request which has gone through several stages (or tiers) of the ILL system takes about four weeks to be filled. This has been confirmed by many surveys. This is particularly frustrating (and wasteful) if the item wanted comes too late anyhow. - Or in the eyes of many readers: the ILL system is free but awfully inefficient - but still several million ILL requests are handled each year. - And yet: if the ILL system were very much more efficient would not the number of ILL requests increase still further? These are questions which cannot be answered at present.

Another prospect of an improved ILL system would be the automation of the regional union catalogues with online access by the participating libraries. The costs for automation would probably be very high. Some projects are already in the offing, e.g. in Lower Saxony, but mostly the regional union catalogues depend on card catalogues though some have made their holdings available on microfiche. Automation will take a long time and union catalogues are only a record of what is not available locally but in another library.

Though an ILL system is absolutely necessary it must be regarded as a surrogate; even the best system cannot be a substitute for simply going to the shelf in one's own library and pulling the wanted book or periodical volume from the shelf. Local supply should be the predominant feature.

In this respect a recently published study on 'Document Delivery in the United States'²⁰ could be mentioned and some interesting remarks are worth quoting: (1) 'While the consultants have strong biases in favor of improving document delivery, they reluctantly conclude that the actual performance of the (ILL) system has done an excellent job of convincing users to wait. Libraries contacted appear not to be getting many complaints about the performance of the system' (p. 62) and (2) 'Document delivery does not appear to be a high priority concern of the library profession as a whole, but rather of a limited number of concerned librarians who are actively assessing the future of libraries. The low level of concern expressed by library administrators and persons responsible for ILL in the libraries contacted may be partially attributable to the fact that most libraries' annual ILL volume amounted to only one percent or so of the annual circulation level and because library patrons appear not pressing them to make changes in the service' (p. 60).

These remarks amply demonstrate how difficult it is to compare one ILL system with those in other countries with variant library philosophies, different funding of libraries (private and state funding) and vastly different geographical conditions and, partly, political structures. On the other hand the basic problems remain very much the same.

Hannover University Library and Technische Informationsbibliothek (UB/TIB)

As this paper is addressed to IATUL members some more details will be presented about this central library. As mentioned above the Technische Informationsbibliothek (TIB) is the oldest of the four central libraries in the Federal Republic of Germany and TIB was founded in 1959. The main reason for establishing TIB in Hannover was the existence of the intact and comparatively large stock of the library of Technische Hochschule Hannover as it was called at that time. One could regard the TIB as an annex or extension of University Library Hannover (Universitätsbibliothek Hannover (UB)), but TIB has become by now a much larger operation (in funds, intake of materials, and staff). Though the German Research Society (Deutsche Forschungsgemeinschaft) initially provided much of the prime money to get TIB started, TIB is presently funded by 30 % from the Federal Government (through its Ministry for Research and Technology (Bundesministerium für Forschung und Technologie)) and by 70 % through a cooperative funding scheme of the eleven Länder (regions) under which each of the Länder has been assigned a different quota.

The name is 'Technische Informationsbibliothek', but TIB not only collects material in the field of technology, the basic sciences of technology, like mathematics, physics, and chemistry are also catered for. The word 'information' in the name could suggest that a large information and documentation centre is being maintained at Hannover. This, however, is not the case.

The University Library (UB), founded in 1831 currently receives about 4,400 periodicals and the book stock numbers about 1,900,000 bibliographical units (in this number are 40,000 doctoral dissertations). The number of staff is 73. The book budget is about 1.5 mill. DM for 1984.

The TIB receives about 15,400 current periodicals and there is a book stock of about 800,000 bibliographical units. The number of US doctoral dissertations and US reports (most of them in microform) approaches the one million mark. The number of staff is 136 and the book budget is about 4.5 mill. DM for 1984.

Literature acquisition by TIB is on a comprehensive scale. In particular, periodicals (and serials) are collected regardless of country of origin, language and scientific level. This means that even trade-type journals (say plumbers' journals) are added to the stock. The acquisition of new periodicals titles is conditioned by actual or expected future demand. One very important aspect is the coverage of periodicals by abstracting and indexing services; if a journal is covered or only monitored by one of these services demand is likely to occur.

Though the above-mentioned subject areas (technology and its basic sciences) seem to be clear-cut and obvious to anyone requesting literature from Hannover there are, however, some peculiar facts. One could imagine that TIB would be complete for all literature covered by Chemical Abstracts. Or in other words: would TIB have everything covered by this very comprehensive service? The answer is a large YES and a small NO. - According to recent data one third of all literature covered by Chemical Abstracts is in the field of biochemistry. - A fairly large amount of publications in this field are, however, published in biological or medical journals. These are not held in Hannover. Also patent specifications (Chemical Abstracts covers pertinent ones from 26 countries) would not be available.

Though the term 'Biotechnology', which is presently becoming quite popular (or Gene Technology) would suggest that literature in this field (comprising somehow 'technology') would also be collected on a large scale, the actual situation is quite different. 'Biotechnology' is an umbrella (or generic) term which also covers fields like 'gene splicing', 'monoclonal antibodies', 'protein engineering' or 'microbiological engineering' and many of the journals (or conference proceedings) containing articles in this field would not

be held in Hannover. So far the small NO. But it can be assumed that this literature would be available from the other central libraries covering these fields.

There have been frequent suggestions, in particular from industry, that literature in the field of economics, business administration, marketing, personnel administration, and management science should also be made available from Hannover. But this is a field into which TIB would not go though it is understandable that special and company libraries would like to have a one-stop address for all their literature requirements.

For most of these libraries UB/TIB Hannover is a library of first resort which means that this library can be directly approached by anyone. But this direct service is not free. Requisition forms can be purchased at 10.-- DM (for German customers) and photocopies of journal articles are provided or books are sent on loan. Slightly higher charges apply for customers outside the Federal Republic. More details are provided in the Appendix. If the bibliographical details provided on the request forms are correct and material is available at UB/TIB the customer can expect to have the requested photocopies etc. within a week on his desk.

UB/TIB Hannover is also a library of last resort. - This means if everything else fails there is a good chance that material wanted regardless of age, origin, language, mode of publication, difficulty of access initially could be supplied from Hannover. No one will have the courage to declare that everything will be available but a success rate of say, 90 %, is very nearly approaching the upper limit. Expecting more would be asking for the impossible. UB/TIB Hannover has been operating now for 25 years and taking everything into consideration this upper mark is being reached in the daily operation of supplying the literature requested in the field of technology and its basic sciences. On the average 1,500 requests are handled each working day and thereby this library in Hannover is fully aware of the market.

A few Remarks for Libraries or Librarians Outside the Federal Republic of Germany

It would be clear from the foregoing what to expect in regard to document delivery from UB/TIB Hannover. To some extent the ZAG - 3 union list will be a help for locating periodicals which are not within the scope of UB/TIB.

It cannot be assumed that foreign libraries or librarians will have in each case an idea which library in the Federal Republic to approach for literature beyond the scope of UB/TIB or other libraries listed in ZAG - 3.

One point of approach would be

Staatsbibliothek Preussischer
Kulturbesitz
Clearingstelle für den Internationalen
Leihverkehr
Postfach 1407
D-1000 Berlin 30
Federal Republic of Germany

This Clearingstelle is prepared to direct requests to an appropriate library in the Federal Republic of Germany.

It is obvious that all bibliographical data should be as complete as possible. In case of doubt a xerox copy of the source of the citation of the item wanted is of great help.

Very little definite information can be given on any costs involved. Most libraries have their own charging system though in lucky circumstances photocopies might even be provided free of charge.

It is helpful if any correspondence is in German but English is understood in most German libraries. If you are not too sure about your German and if you are more proficient in English, try that.

Appendix

Services and Bibliographical Aids available from UB/TIB Hannover

- (1) Loan and/or photocopy service. Prepaid requisition forms are available at the following rates for customers

Inside the Federal Republic	10.-- DM each
Outside the Fed. Rep., in Europe	13.-- DM each
Outside Europe	15.-- DM each.

For each form:

up to 16 pages xerox or up to

4- microfiches from stock already in that form or

4 meter of film duplicate from stock already in that form

or

loan of one book (German books only).

Outside Europe material would be sent by airmail.

- (2) Special services

Rush orders (same day delivery) can be placed by

- Telephone (0511) 762-2268

- Telex 0922168 (tib/hann d)

- Telefax (0511) 71 59 36.

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- (4) TIBORDER via DIALOG and CSA/IRS. If you have access to these bases consult the Manual of these services.

Bibliographical Aids Available from UB/TIB Hannover

(1) ZAG - 3

ZAG is the acronym for a rather long title: Zeitschriftenbestände auf den Gebieten der angewandten Wissenschaften und ihrer Grundlagenfächer in Zentralen Fachbibliotheken und einigen anderen Bibliotheken mit besonderer Bedeutung für die überregionale Literaturversorgung.

The third edition (as per January 1984) records 170,000 holdings of the central subject libraries and of a number of other libraries with periodical holdings in related subject areas like pharmacy, forestry, and fisheries.

ZAG - 3 is available on 46 fiche at 45.-- DM from UB/TIB Hannover.

Information is provided on holdings for each periodical title in ZAG - 3 together with the code and shelf-mark of each individual library.

(2) Zeitschriftenverzeichnis ZV 89 (83). Stand: September 1983. 722p.

'89' is the code for UB/TIB Hannover in the German ILL system. - Titles for over 35,000 periodicals (including numbered conference series) are listed. This is a title-list which does not provide holding information for particular volumes. A large number of cross-references for variant titles and abbreviations greatly help to identify particular titles. Shelf-marks are given.

ZV 89 (83) is available at 45.-- DM from UB/TIB Hannover.

Address for all orders and correspondence:

Universitätsbibliothek und TIB
Welfengarten 1 B
D-3000 Hannover 1
Federal Republic of Germany.

Telephone: (0511) 762 2268

Telex: 0922168 (tibhn d)

Telefax: (0511) 71 59 36. CCITT Group 3 equipment

Enquiries on the telefax service: (0511) 762 34 26.

The whole alphabetical catalogue of UB/TIB Hannover has been put on microfiche in 1983 and this is available as 'Kataloge der Technischen Informationsbibliothek, Hannover. Microfiche-Edition'. Part of this catalogue is a special section on conference proceedings held. The whole catalogue comprises 664 fiche and it is sold by K.G.Saur, Munich at 4,500.-- DM.

For Further Reading

In German

- (1) SINOLOWITZ, B. & KRATZSCH, W., eds. Die Ordnung des Leihverkehrs. Text und Kommentar der Leihverkehrsordnung von 1979 mit erläuternden Beiträgen. Frankfurt/Main, Klostermann, 1982. 166 p.
(Zeitschrift für Bibliothekswesen und Bibliographie. Sonderheft 35)

This is the official ILL code with some comments on special material, like maps or sheet music. It also contains a subject list of libraries with special collections (the new version of the former 'Sondersammelgebiete'), a select bibliography on ILL (110 items), and a map showing the ILL regions in the Federal Republic of Germany.

- (2) SINOLOWITZ, B. Leihverkehrsfibel. Kurzgefasste Anleitung zur Praxis des Leihverkehrs der Deutschen Bibliotheken. Mit Text und Kommentar der Leihverkehrsordnung 1979 und einer Auswahlbibliographie zum Leihverkehr 1971 - 1982. München, Saur, 1983. 146 p.
(Bibliothekspraxis. Bd. 24)

A primer for ILL librarians with many practical hints

- (3) Überregionale Literaturversorgung von Wissenschaft und Forschung in der Bundesrepublik Deutschland. Denkschrift. Boppard, Boldt, 1975. 116 p.

This is a report or memorandum by the library committee of the German Research Society (Deutsche Forschungsgemeinschaft) and it gives an excellent view of the situation and the philosophy of ILL in the Federal Republic of Germany. - This publication has been critically reviewed by M.B. Line in *Journal of Documentation*, vol. 31, (1975) no. 4, pp. 305-306.

- (4) TEHNZEN, J. & JACOB, W. Die regionalen Zentralkataloge, die 'Negativstelle' und das GAZS. Berlin, Deutscher Bibliotheksverband, 1978. 176 p.
(Bibliotheksdienst. Beiheft 116/117)

Both authors visited all central union catalogues in 1975 and this report is a critical survey of the ILL practice at that time. Though this report was widely discussed on publication it finally had little impact on the structure and operation of the German ILL system.

- (5) FABIAN, B. Buch, Bibliothek und geisteswissenschaftliche Forschung. Zu Problemen der Literaturversorgung und der Literaturproduktion in der Bundesrepublik Deutschland. Göttingen, Vandenhoeck & Ruprecht, 1983. 345 p.
(Schriften der Stiftung Volkswagenwerk. Bd. 24)

The author is not a librarian but professor of English at Münster university. The book is written in a very engaging style and the author knows what he is talking about; he has also been a member of the library committee of the German Research Society. It makes interesting reading but it should be read in conjunction with some reviews, e.g. the long one by H. Lohse in *Mitteilungsblatt. Verband der Bibliotheken des Landes Nordrhein-Westfalen*, vol. 34 (1984) no. 2, pp. 125-135, or the English language review by H. Schnelling in *LIBER News Sheet*, (1984) no. 12, pp. 49-51.

- (6) VON BUSSE, G. Struktur und Organisation des wissenschaftlichen Bibliothekswesens in der Bundesrepublik Deutschland. Wiesbaden, Harrassowitz, 1977. 890 p.

This is a monumental work and it will be the standard publication on German research libraries for a long time to come. The author was for many years head of the library section of German Research Society (Deutsche Forschungsgemeinschaft).

- (7) Deutsche Bibliotheksstatistik. Berlin, Deutsches Bibliotheksinstitut, annually.

This enormously detailed statistical compilation is published in three parts: Teil A: Öffentliche Bibliotheken, Teil B: Wissenschaftliche Bibliotheken, Teil C: Spezialbibliotheken und nicht-universitäre Hochschulbibliotheken. It is usually available in July or August with data for the preceding year.

In English:

- (8) VON BUSSE, G., ERNESTUS, H., & PLASSMANN, E. Libraries in the Federal Republic of Germany. Wiesbaden, Harrassowitz, 1983. 288 p.

Not quite an abridged version of item (6) above. It deals with all kinds of libraries, not only research libraries. There is even a chapter on halts on a library study tour if someone wants to visit (as a librarian) institutions in the Federal Republic.

- (9) Studies on the Organisational Structure and Services in National and University Libraries in the Federal Republic of Germany and in the United Kingdom. Papers presented at a Joint Meeting of British and German Librarians in September 1978. München, Saur, 1979. 227 p.

A number of papers deal with the German ILL scene, e.g. D. Oertel: Supra-regional co-ordination of libraries in the Federal Republic of Germany; G. Schlitt: Central subject libraries in the Federal Republic of Germany (this deals mainly with UB/TIB Hannover); R. Landwehrmeyer: University libraries as part of the German supra-regional system of literature provision.

- (10) WEHMER, C. The organization and origins of German university libraries. Library Trends, vol. 12 (1964) no. 4, pp. 491-512.

Though this paper is now twenty years old it gives a very good overview on the historical development and the administration organization of German university libraries at a point in time when the first new universities were founded after WWII (Bochum, Konstanz, Bremen, Regensburg). There are some prophetic remarks on the influence of integrated library systems (in the new universities) on ILL. ('A high degree of cooperation does not simultaneously allow a high degree of autonomy for the particular members of a library system'). The impact of new university libraries on the ILL system was certainly felt for many years; large numbers of outgoing requests but very little contribution as suppliers by the newcomers. The situation has been somewhat alleviated in the last few years.

- (11) DOCOLSYS Report. This report for Document Identification, Ordering and Location Systems for the supply of documents within and between member countries was commissioned by Directorate General XIII of the Commission of the European Communities. The research was conducted by Mr. Alan Singleton in 1982 but the report has not yet been published. - I am particularly grateful to Mr. F.A. Mastroddi of Directorate General XIII for making available to me the section of the DOCOLSYS Report dealing with Germany. Some passages have been taken verbatim from this report.

- (12) PILLING, S. Report of a visit to West Germany, October 1980. - This is an unpublished travel report of a staff member of the British Library Lending Division, Boston Spa, West Yorkshire. 39 p. The historical situation is dealt with in some detail.

- (13) KOHL, E. Library networks and network planning in the Federal Republic of Germany. A State of the Art Report. In: Future of Library Networks. Essen Symposium, 16 September - 18 September 1981. Essen. Gesamthochschulbibliothek, 1982, pp. 15-42
(Veröffentlichungen der Gesamthochschule Essen, No. 4)

This paper deals mostly with automated library network systems and less with actual document delivery.

- (14) LEHMANN, K-D. Structure and practice of Interlibrary Lending in the Federal Republic of Germany. Seminar on Interlibrary Lending in Western Europe, Boston Spa, 26-28 September, 1983. 11 p.

A general overview.

- (15) TEHNZEN, J. Interlibrary loans outside the official network in the Federal Republic of Germany Seminar on Interlibrary Lending in Western Europe, Boston Spa, 26-28 September, 1983. 8 p.

Describes the services provided by UB/TIB Hannover.

- (16) DRUBBA, H. The university library Hannover and Technische Informationsbibliothek as a library of last resort - or as a library of first resort. Some aspects of the operation on the largest technical library in the Federal Republic of Germany. Presented at the 10th Biannual Conference of IATUL, Essen, June 6, 1983. 18 p.

This paper will appear in a forthcoming issue of IATUL Proceedings.

- (17) KALTWASSER, F.G. International Lending from libraries in the Federal Republic of Germany. IFLA Journal, vol. 6 (1980) no. 3, pp. 258-260.

- (18) NEUBAUER, K.W. Online Information Services, Document Delivery Systems, and libraries in the Federal Republic of Germany. Information Technology and Libraries, vol. 3 (1984) no. 2, pp. 109-129.

- (19) KAEGBEIN, P. & KNOCH, M. Holdings and access in the BRD: needs, tools and problems. Library Review, vol. 32 (1983) part 4, pp. 259-281.

- (20) Document Delivery in the United States. A Report to the Council on Library Resources by Information Systems Consultants, Inc., October 1983. Washington, D.C., The Council, 1983. 78 p.

- (21) HEYDRICH, J. Interlending policies and plans in the Federal Republic of Germany. BLL Review, vol. 4 (1976) no. 2, pp. 47-50.

- (22) LANDWEHRMEYER, R. A planned decentralized solution for national document supply: the Federal Republic of Germany. Interlending Review, vol. 9 (1981) no. 4, p. 122-127.

- (23) RICHARDS, P.S. 'Aryan librarianship': Academic and research libraries under Hitler. Journal of Library History, vol. 19 (1984) no. 2, pp. 231-258.

A detailed paper with many references describing a period on which practically nothing has been published in the postwar German library literature.

INTERLENDING IN THE GERMAN DEMOCRATIC REPUBLIC AND THE TECHNOLOGICAL UNIVERSITY LIBRARIES

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Definitions

Inter-library lending in the German Democratic Republic serves the purpose of rapidly and comprehensively fulfilling the demand for socially necessary literature¹. It should be carried out in such a way that the citizens of the GDR, in every part of the country, are supplied with the required sources of information without delay. In this way the differences in acquisitions arising from the local distribution of bookstocks and profiles of libraries are compensated for.

Inter-library lending in the GDR is based on the organised coordination of libraries and information centres with the aim of lending stocks to external libraries or information centres for making these available to the latter's users².

The regulations governing the organisation of inter-library lending in the GDR are laid down in the "interlending regulations" of 17th November 1975 and in the instructions concerning these regulations issued 1st January 1976³.

Union catalogues are an important aid in accelerating inter-library lending. These provide the means for checking the stocks managed by all or several libraries and information centres of the GDR. The Deutsche Staatsbibliothek Berlin is the central office for the direction of inter-library lending in the GDR with its "Institut für Leihverkehr und Zentralkataloge" and is responsible for the union catalogue of the GDR⁴. This consists of the "Central Catalogue of Foreign Monographs" and the "Central Catalogue of Foreign Periodicals and Serials". A regulation governs the registration requirements⁵. This regulation states that, in addition to the central catalogue at the Deutsche Staatsbibliothek, so-called regional union catalogues can be kept.

Inter-library lending as a form of cooperation and communication

Inter-library lending is one of the oldest examples of library cooperation, and nowadays it has become a necessity in scientific communication. The special literature reports⁶ that as early as the 17th Century an organised system of lending existed between the French

Royal Library and the library in the Vatican. At that time only books and journals existed as a means of written scientific communication; the universal library reigned unchallenged, there were only a few examples of special libraries, technical libraries did not exist at all. However, one can only really talk about inter-library lending in the modern sense of the word ⁷ from the turn of the century; in this connection, it may be noted that the Deutsche Staatsbibliothek in Berlin kept exact statistics as early as 1905 ⁸.

It was namely around 1900 that the avalanche of information began as an expression of the forced pace in the development of science and technology which led to a new, higher form of scientific communication. The consequences were, amongst others, the emergence of new information sources and the production on a massive scale of traditional information sources, the foundation and considerable expansion of special libraries, the coming into being of scientifically managed information and documentation, the foundation of international organisations such as the FID, IFLA, INTAMEL and IATUL, the concentration of libraries on subject specialisation, the transition to electronic media. The processes are still continuing today, being in fact accelerated due to the influence of microelectronics. Under the demand for the immediate acquisition of all information sources required by the users, inter-library lending has changed dramatically. It is not a chance or secondary occurrence in the day-to-day running of a library, but a scientific task necessitating great organisational, technical, and even operational inputs. This is especially true of technical libraries and information centres which acquire information urgently required in the economy and for the development of science and technology. The libraries of technological universities have, in addition, to cater for teaching and research at their own establishments.

It is in this context that inter-library lending is conducted in the GDR. The libraries of the technological universities play a major role, in this connection, in supplying literature in the fields of the natural sciences and technology.

The libraries of technological universities and special networks

The libraries of the technological universities in the GDR, especially the three IATUL member libraries, have been given a new and important task: the responsibility for a special library network. The library of the Technological University of Dresden is the central special library for electronics and electrical engineering, the library of the Mining Academy Freiberg for mining and metallurgy, the library of the Technical College Karl-Marx-Stadt for mechanical engineering. These libraries manage the special library network, which includes libraries and information centres with various orientations. Library networks of this kind are governed by statute in the GDR ⁹.

In addition to the system of inter-library lending of the GDR there is also the possibility for libraries within a special network of libraries to conduct so-called inter-library lending within the network. These problems will be dealt with here using the example of the effectiveness of the work of the library of the Mining Academy Freiberg, in its role as a central special library for mining and metallurgy, and thereby its effectiveness in the special network of libraries for mining and metallurgy. The literature of mining and metallurgical sciences, as well as the related subjects of the geosciences, silicate technology, energy technology, processing technology and subject-areas of chemistry is concentrated in this special network, in as far as these subjects are necessary for the economy of the GDR. And this is how it should be because the teaching, investigation and/or production of the GDR in these fields is concentrated in the member-establishments. This means that in the libraries and information centres all categories of sources of information are present in so far as they relate to mining and metallurgy. However, in the central and regional catalogues of the GDR only books and journals are registered, the whole spectrum of grey literature: patents, standards, trade publications, research and development reports, university publications is missing. For this reason it was one of the main tasks in this special network to put together a central catalogue - to clarify questions of context and regulate organisational matters. It was possible to begin inter-library lending within the network proceeding from this basis. The basic regulations are:

1. All libraries take part on an equitable basis.
2. Lending takes place on a library-to-library basis.
3. The supplying of information sources is conducted according to regulations governing copyright of the original, copies, or microforms.
4. The basis for ordering and lending is the legally obligatory inter-lending form, though special arrangements can be agreed upon. The inter-lending form is to be marked "network internal".
5. The supplying of information sources is carried out according to the user regulations of the libraries concerned.
6. Loan periods, delivery, charges and paying of damages should be regulated according to current legal directives.

Inter-library lending in the GDR at the regional levels of district and county, and nationally, is enriched and at the same time relieved with regard to special literature by the special library network.

Ethical problems involved in inter-library lending

Inter-library lending is dependent on available information sources, and people. Of considerable importance for the quantitative and qualitative achievement of the tasks in inter-library lending is the attitude of the librarian to this problem. In numerous discussions on possibilities of accelerating procedures in inter-library lending the author was forced to conclude that technical organisational, material problems or problems connected with storage capacity never represented the central factors hampering efficiency, but rather matters connected with personnel. These were matters of:

- the suitability of staff for duties in inter-library lending
- the attitude of staff to the satisfaction of users' demands from their own university and of those from another locality
- the stress placed on inter-library lending during initial and further training of librarians
- the bibliographic knowledge of librarians

Ideological problems have as a matter of fact always played a role! But professional ethics are playing to an increasing extent a great role in the daily work process, because subjective factors are becoming more and more decisive in performing such tasks - this is also true of librarianship¹⁰. Library ethics in one library and for one library are themselves certainly not easily resolved. Inter-library lending is, however, always conducted for the benefit of another library, in a special library networks indeed for many libraries. The question, therefore, arises: how does the librarian behave in the process? In evaluating national and international experiences gained in establishing special library networks in the natural sciences and technology for the IFLA General Conference Nairobi 1984, I have summarized several aspects of library ethics¹¹. Inter-library lending occupies a considerable part in these considerations. József Zsidai turned his attention at IATUL conferences and in many publications to cooperation. One of his most recent articles bears the title "human factors in cooperation between libraries"¹². It is just this, which represents the framework for inter-library lending, and even if József Zsidai lists the motivations for opposition to cooperation, then the disinclinations he cites for all areas of work remain equally valid for this aspect: the fear of losing sovereignty, loss of autonomy, an increase in bureaucracy, uncertainty regarding planned results, fear of criticism.

One must make use of complete optimism, act as an example, and above all stress the results achieved (positive results!), in order to arouse enthusiasm amongst staff for inter-library lending.

Trends

In view of the steadily increasing flood of information, the introduction of new media in publishing and the tendency towards the narrower subject specialisation of libraries, inter-library lending will continue to expand still further. In this context changes in organisation will also have to occur, in order to ensure the quantitative development regarding schedules and quality. Some problems arise connected with this in the university of technology libraries, which are not dealt with often enough in the special literature or in exchanges of opinions:

- ethics and inter-library lending: These are not contradictions, we must take the common responsibility of all libraries for the rapid availability of information sources as the starting point.
- user training and inter-library lending: The training of users has not sufficiently emphasized the inter-library lending system and has left the availability of sources of information to chance.
- lending forms and inter-library lending: The users are criticising to an increasing extent the "rigid" lending form and are demanding other - more convenient and quicker - forms to achieve more rapid availability of information sources.
- technology and inter-library lending: An increasingly clear "gap" between the information sources registered in computerized information systems and the efficient acquisition of these sources by the libraries is becoming apparent.

At its 8th and 9th Meetings the IATUL dealt thoroughly with questions of cooperation and communication¹³ - a necessary complement to this is the present issue of the IATUL Proceedings on "Interlending and Document Delivery".

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NEW DEVELOPMENTS AT THE CENTER FOR RESEARCH LIBRARIES *

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In 1980, The Center for Research Libraries (CRL) began a ten-year effort to redirect its programme and to improve its long-term financial viability. This effort has three overlapping phases.

First, a three-year planning phase was instituted in 1980 to explore the alternatives open to CRL for its long-range development. This phase seeks to produce by early 1983 a Long-Range Plan for Programmes and Finances that has the approval and support of the members and users of the Center. Second, a five-year transition phase was started in 1981 to design and implement the structural and policy foundations necessary to bring the revamped mission and redirected functions of CRL to fruition. This phase, working with the CRL Priority Initiatives (detailed below), is to be completed by 1986. Third, a seven-year development phase will start in late 1983 to complete the redirection and expansion of CRL's programmes and the revitalization of its financial base. This major effort is based on the needs (as articulated in the planning phase) of the membership and participating North American libraries, and on the consensus of the CRL members as to functions, programmes and policies.

The planning process has clarified the purpose of the Center for Research Libraries. This is a non-profit corporation established and operated by scholarly and research institutions to increase the availability of research resources and materials to libraries throughout North America. Three essential functions of CRL were identified in the planning process; each of these is conducted both as an operational services component of CRL and as an international cooperative effort among libraries.

The first function, Collection Management Center, seeks to strengthen the resources available for research in North America by encompassing the identification, acquisition, bibliographic control, and maintenance of a major research resource collection of materials housed in a centralized storage and lending library. Further, it provides assistance to participating libraries in the coordination of rational collection management policy among the libraries in a major cooperative system.

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The second function, Preservation Center, provides a service to preserve and make available the unique and rarely-held segments of CRL's collection in many languages and formats drawn from around the globe. As part of lending a focus to multi-library cooperative efforts in preservation, the Center for Research Libraries will offer a major service to produce, store (under rigid environmental controls), and deliver (in positive copies) a wide spectrum of materials from participating libraries' collections to be preserved by alternative formats.

The third function, Access and Delivery Center, augments local collections by providing time-effective and cost-effective bibliographic and physical access to and delivery from the CRL dedicated-to-lending collection and other resources contracting with CRL to deliver materials upon demand. Materials, with an emphasis on the journal literature, will be loaned in original format as well as delivered in facsimile via electronic means.

A primary framework for the CRL's redirection effort consists of the five Priority Initiatives adopted by the Board of Directors in September 1980. Research libraries in recent years have undergone dramatic changes in the economic resources available to meet the challenges of increasing demands for local collections, local services, expanded usage of new library technology, and the explosive growth in publishing, both in quantity and cost. The Priority Initiatives cluster in two groups. First are the three organizational improvement efforts:

1. Improving CRL facilities

Current operations as well as future growth and development have been hampered seriously by the lack of adequate space for collections and staff. A Building Project Design Statement was written and approved in 1981. It includes four phases of construction, which, if all are completed by the mid-1990s, will provide the Center's space requirements for at least the next three decades. Changes in storage technology, now occurring at an ever-increasing rate, may obviate the need for all or parts of the remaining phases of construction. An Implementation Plan for the first phase was approved in 1981 and completed in 1982. The second phase would build a mirror-image facility co-joined with the present building on land already owned by CRL. The second phase would double the available space for materials and staff in the first phase, which nearly doubled the space of the original building, still utilized as a compact storage facility for little-used research materials. The second phase would add several special-purpose features in line with the expanded functions outlined above. The final two building stages would be constructed for compactly housing the lesser used materials.

2. Improving bibliographic access.

Informal surveys of members and others have indicated that the greatest barrier to the use of CRL's collections (and, therefore, to increasing the value of CRL to a library) has

been the lack of adequate bibliographic access, particularly with the advent of online union catalogues and electronic interlibrary loan systems. Roughly half of the Center's collection components are catalogued, as a matter of policy. The rationale for the remaining collections is, that they are considered comprehensive in scope, and that a requesting library need only ask and the probability of CRL having the item is better than 70 %. The first phase of the Bibliographic Access Project, began in 1981 and completed in 1982, edited, microfilmed and distributed an up-to-date version of the Center's own card catalogue; and the first phase initiated the usage of OCLC Online Computer Library Center for current cataloguing. The second phase of the Project, begun in late 1982, begins a multi-year effort to convert the retrospective cataloguing records and holdings of CRL to machine-readable format and place the records in appropriate data bases. The third phase of the Project, to be undertaken in 1987, will examine and evaluate the present policies for bibliographic control.

3. Improving organizational processes

Through several different avenues of work, a number of administrative, governance, managerial, communications, structural, and policy questions are being addressed. In early 1980, the Center for Research Libraries began to expand its planning, budgeting, public relations, development, and membership promotion/retention functions. The effort to place an improved structure to better carry out the business of the Center is absolutely central to achieving the other four Priority Initiatives.

The final two Priority Initiatives are programme improvements:

4. Improving CRL's functional programmes

CRL's collection programme developed over three decades of members' deposits and purchase programmes. The materials gathered in a centralized storage and the dedicated lending collection have become a major North American resource. The cooperative collection management exercised by the membership in determining what to deposit at CRL or what to buy or not to buy has provided a foundation for a very successful, long-standing effort of cooperative acquisitions among major research institutions through a rational, multi-national collection management system. As noted above, the preservation and access and delivery functions are also under scrutiny for programme expansion. The first phase of this effort, begun in 1981, examines the policies related to acquisitions by purchase and deposit and loan and delivery of materials, whether from CRL or one of its resources. The second phase, to be initiated in 1983, is the expansion of long-term activities in preservation by alternative formats using technology on an increasing basis. CRL will become a major central holding point for microform masters produced by North American institutions, from which positive copies will be delivered upon demand with an appropriate royalty for the owner. The final phase will attempt to link together the function of collection management, preservation and access and delivery through the usage of technology to reduce the cost of library operations.

5. Improving access to the journal literature

Clearly an urgent need of research libraries, if not all libraries, is to solve the problems associated with the access to the growing journal literature. The first phase of this initiative, begun in 1982, added small test samples of journal subscriptions to CRL's present journal collection. The second phase, planned to begin in 1983, will add substantially increased numbers of journal titles to the collection as well as establish contractual relationships with a variety of other sources of journals upon demand. The final phase will use technology to construct a rational system for periodical storage and delivery for North American libraries.

REQUESTING PERIODICAL ARTICLES WITH THE NETHERLANDS UNION CATALOGUE/ INTERLIBRARY LOAN SYSTEM : NCC/IBL

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1. Introduction

The NCC/IBL system is mainly developed as an instrument to serve the Netherlands interlibrary loan practice. Interlibrary loan through union catalogues has a long history in The Netherlands, but several surveys pointed out, that improvements were necessary.^{1, 2, 3} The major complaint was the slow procedure of the manual ILL. So in 1980 it was thought that improvements could be made by:

- a more accurate and fast localisation of material
- the help of a complete and up-to-date union catalogue
- having this catalogue accessible online
- and open for everyone in The Netherlands.

It was decided then to start with the periodicals part of the Netherlands Union Catalogue (NCC). The input to the NCC had to be made from the three existing union catalogues, while the National MINIFORMAT was chosen as the exchange format.

Special procedures had to be developed for people and institutions with no online connections. System development and operation was given to the PICA-office, where a PDP11/40 computer was installed in 1982.

2. Periodicals database

To be able to feed the NCC with periodical information all three union catalogues had to have some conversion programming to cope with the MINIFORMAT. Some manual work had also to be done, to give the best mix of the bibliographic information in the NCC. A special overwrite and enrichment program was written to handle the input of material, which was done by magnetic tape.

So the bibliographic information in the database is now a mixture of the information from the three union catalogues. The holding information of each of the participating libraries is the responsibility of the union catalogue to which this library belongs.

The first loading was completed in the spring of 1983 and resulted in a database of about 180,000 periodical titles with holdings of over 300 libraries. Since then updating is done on a more or less regular basis with tapes of the three union catalogues. With special input programs all new, changed and deleted titles and holdings are put in place.

3. Searching periodicals

To input an ILL request for a journal article, one has to search the journal title first. Searching in the NCC/IBL system is done by using search-keys, and these are entered with a prefix code to identify the search field. For periodical titles one can use words from the title (TTI=), words from the corporation (COR=), ISSN numbers (ISS=) when available, and production numbers from the NCC database itself or any of the union catalogues.

Boolean combinations are possible between sets with search results, and also within one search statement. (See Fig. 1)

NCC Zoeken	Kosten Fl.	0,33
Actie : <u>TTI=LIBRARY</u>		:
1 C 8273 TTI=LIBRARY		
NCC Zoeken	Kosten Fl.	0,66
Actie : <u>TTI=TECHNOLOGY</u>		:
1 C 8273 TTI=LIBRARY		
2 C 8793 TTI=TECHNOLOGY		
NCC Zoeken	Kosten Fl.	0,99
Actie : <u>1#2</u>		:
1 C 8273 TTI=LIBRARY		
2 C 8793 TTI=TECHNOLOGY		
3 C 113 1#2		
NCC Zoeken	Kosten Fl.	1,32
Actie : <u>TTI=LIBRARY*TECHNOLOGY</u>		:
1 C 8273 TTI=LIBRARY		
2 C 8793 TTI=TECHNOLOGY		
3 C 113 1#2		
4 C 113 TTI=LIBRARY*TECHNOLOGY		
NCC/IBL Verkorte-titel-presentatie [Geselecteerd: 11 titels]		
Actie : <u>T3</u>		:
SET:TTL JVU ITAU	IAUT81/COR81/CON81	IIMP
3: 1	lannual report library techn	lamerican library as lchicago
3: 2	lannual report library techn	lamerican library as lchicago
3: 3	lpublikation kungliga teknis	lk. tekniska hogskol lstockholm
3: 4	lpublikation k.t.h. bibliote	lk. tekniska hogskol lstockholm
3: 5	lscience and technology info	lkokuritu kokkai tos ltokyo.
3: 6	1965 llibrary technology reports.	lamerican library as lchicago
3: 7	ln.l.l. news. a news-sheet o	lboston
3: 8	1961 ln.l.l. translations bulleti	lnational lending li london
3: 9	lilst / technion-israel inst	ltechnion-israel ins lhaifa
3: 10	lscientific american resourc	lisan franc
3: 11	1965 lthe sourcebook of library t	lamerican library as lchicago

Fig. 1 Some examples of searching NCC periodical titles and a short-title presentation. (all typing is underlined)

All other commands are given by one-letter mnemonic codes, where sets are identified by number, and items within the set can be specified. Special formats of presentation are entered by one-letter codes, and bibliographic fields by three letters.

A typical command looks like: T3:6/I, which asks to show (T) the 6th item of set 3 in ISBD (I) presentation. The result will be something like fig. 2.

```
NCC/IBL 1980-presentatie      [Geselecteerd: 1 titels] Blad : 1
Actie : T3:6/I                :

      SET: 3, TITEL: 6 uit: 11      [NCC-nummer: 828897827]
      library technology reports. a service to provide information on library
      systems equipment and supplies to the library profession. - chicago :
      ala, 1965-
      ISBN 242586= library technology reports ( 1965-)
      CCP=PA1264198
      CTC= 225665
      CLC= 58133

Dit was de laatste titel.
```

Fig. 2 ISBD presentation showing all production numbers

More experienced users are given the opportunity to use some form of truncation, and the possibility of text searching within a given set, for instance to search for the publisher. In the near future, improvements will be made to overcome the problems of searching titles containing overflow-, or stopwords, and single word titles.

4. Requesting an article

Once the journal title is found, one can put in an ILL request, simply by typing I. Then an online ILL request-form is offered. (See Fig. 3)

```
NCC-IBL 17-88-84 Aanvraagprocedure Periodieken NCC-nummer :828897827
1965library technology reports. a serlamerican library assichicago

==> Is dit de gewenste titel (J/N, Z = terug naar zoeken) : :
( 1) Geef evt. deze aanvraag een eigen identificatie : :
( 2) Gewenst jaar-maand-dag : :
( 3) Volume : :
( 4) Aflevering : :
( 5) Vorm: (L=leen,C=copie,F=microfilm,M=microfiche,<RETURN> = LC) : :

( 6) Auteur : :
( 7) Artikel : :
( 8) Bladzijden : :
( 9) Bron : :
(10) Aanvullende informatie : :
(11) Aantal weken circuleren (<RETURN> = 8 weken) : :
```

Fig. 3 The online ILL-form for periodicals, showing the title selected in fig. 2

The first thing one has to do is to verify the title, and then to put in the year, volume and issue-number wanted. The year or volume has to be given, the rest is optional. Then one has to enter the type of request: for loan; photocopy or both; microfiche or film. Then the system starts real-time holding analysis. It checks if the year and/or volume is available somewhere, looks after the requested issue-number and the type of request, and ends up with a statement like: "This type of request can be fulfilled by 4 or 5 libraries". (See Fig. 4)

```

NCC-IBL 17-88-84 Aanvraagprocedure Periodieken   NCC-nummer : 828897927
1965 library technology reports. a serial american library ass'chicago

==> Is dit de gewenste titel (J/N, Z = terug naar zoeken) : J :
( 1) Geef evt. deze aanvraag een eigen identificatie : DEMO :
( 2) Gewenst jaar-maand-dag : 1984-JAN :
( 3) Volume : :
( 4) Aflevering : :
( 5) Vorm (L=leen, C=copy, F=microfilm, M=microfiche, <RETURN> = LC) : C :
==> Leenvorm bij 4 v.d 5 bibl. mogelijk, doorgean (J/N/C/Z) : :

```

Fig. 4 The first part filled out, and showing the result of the holding analysis

This means that 5 libraries have this periodical issue available, but the fifth library cannot supply this type of request.

The next question asked by the system is if one wants to continue. If so, the author, title of the article, pages, and the expiration date of this request have to be filled in. (See Fig. 5)

```

( 6) Auteur : A. N. GROSCH :
( 7) Artikel : THE IBM PERSONAL COMPUTER. :
( 8) Bladzijden : 61 - 84 :
( 9) Bron : :
(10) Aanvullende informatie : DEMO REQUEST :
(11) Aantal weken circuleren (<RETURN> = 8 weken) : :

CORRIGEREN:

```

Fig. 5 The second part filled out, with standard expiration - period of 8 weeks

The last thing to do is to give information about the requesters name and address. Most of the time orders are from the own organisation, so the address is already available in the system, and some identification can be added if necessary. (See Fig. 6)

```

NCC-IBL 17-88-84 Gegevens van de aanvrager/aanvragende bibliotheek

( 1) IBL-nummer van aanvragende bibliotheek : 2 :
( 2) Identificatie aanvrager (maximaal 12 posities) : :
( 3) Naam aanvrager : Technische Hogeschool Delft :
( 4) vervolg..... : Bibliotheek, afd. PTT :
( 5) Adres : Postbus 98 :
( 6) Postcode en woonplaats : 2600 MG Delft :
( 7) T.a.v. : H. V. D. GEIN :

Wilt U de aanvraag plaatsen (J/N/C/Z, <RETURN> = J) : J :

22849.8583 is uw aanvraagnummer, geef <RETURN> : :

```

Fig. 6 The address form, with just the name added and the request-number shown at the bottom

The major libraries in The Netherlands are offered the possibility, however, of typing in requests for other institutions or individuals. Therefore they can choose one of the pretyped addresses or type in a new one. After a last verification of this information, one has to confirm the request, and then a request number is given. Then the system sends the request immediately to the most likely library for fulfillment.

5. Holding information

Before an explanation can be given on how the requests are distributed among the libraries, some information on the available holdings has to be shown. After finding a periodical title, one can look for the holdings of that title. This can be done by using the command : T/0. (See Fig. 7)

NCC/IBL Overkoepelende Holdings [Geselecteerd: 11 titels] Blad : 1									
Actie : <u>T/0</u> :									
SET: 3, TITEL: 6 uit: 11 [NCC-nummer: 828897827]									
1965library technology reports. a seriamerican library assichicago									
Bibl	Regio	Uitl	A	Jaar - Jaar /	Vol (Afl)	-	Vol (Afl)		
13	00	uitl	A	1979 - ...	15	-	...		
17	00	uitl	A	1976 - ...	12	-	...		
1	00	uitl	A	1976 - ...	12	-	...		
20	00	uitl	A	1975 - 1979	11	-	18		
2	00	uitl	A	1965 - ...	1	-	...		
60	00	uitl	A	1965 - 1972					
3	00	uitl	A	1965 - ...					

Fig. 7 General holding information on the title in fig. 4

The first column contains the ILL-number of the participating libraries. For instance number 2 is the library of Delft University of Technology. The second column is not in use now, but can be used for region-codes. The third column gives the availability codes, for instance: uitl= for loan or photocopy; fcop= just photocopies.

The A code means that the holding is uninterrupted, and the next columns give the year, volume and issue number of the beginning and the end of the holdings. So a request for the year 1984 for the title in fig. 7 will be analysed by the system as available in 5 libraries.

More detailed holding information is available with the command T/H nn, where nn is the ILL-number of the library wanted. (See Fig. 8)

NCC/IBL Holdingpresentatie [Geselecteerd: 11 titels] Blad : 1									
Actie : <u>T/H2</u> :									
SET : 3, TITEL : 6 uit : 11 [NCC-nummer: 828897827]									
1965library technology reports. a seriamerican library assichicago									
EIGENAAR : [2] Technische Hogeschool Delft									
uitl [sig] 3548									
[jr.] 1965 [vol] 1 -									

Fig. 8 Detailed information on the holding of the library of Delft University of Technology

In Fig. 8 it is shown that the library shelf-list number is also available (sig) and irregularities in the holding can be seen. For putting in an ILL-request one does not have to look for these holdings, but it can be very much of interest for library acquisition purposes. Of course, the information in the NCC is as good as the information given to the union catalogues by the individual libraries.

6. Distribution of requests

After the input of an ILL-request, the system has to decide to which of the libraries found it has to be sent first. As already described, this is done in real-time, so theoretically the receiving library can fulfill the request immediately.

The main principle for the distribution of the requests is a fair division of the workload over all participating libraries. This is done by an algorithm with several parameters for each library and some general weighting factors. The two parameters in use now are: the type of library - there are 15 types available, which are based on the level of ILL service a library must be able to provide-and the threshold value, or the absolute maximum number of requests a library can handle in one day. Other possible parameters are: the region, specially asked for by the public libraries; special circuits, for instance for technical or agricultural libraries; and a priority level.

These parameters can be changed daily and are under control of the three union catalogues together, in close co-operation.

The controversial point is that to improve the ILL one can consider decreasing some of the parameters of the libraries with bad performance, but this will result in an increase in the workload for the better libraries.

7. Handling of requests

The handling of incoming ILL requests is only described for libraries with full online connections to the NCC. The others get forms printed at the central facilities, and sent by post.

Each of the libraries has to ask the system each day if some new requests are waiting, and if so, these can be printed locally in a special format. A two-part form is printed, where the upper part contains all the information needed for the fulfillment of the request, including the requester's address. The second part is the so-called "answer form", this can be used internally in the library. This is especially useful if the circulation or photocopy staff is not the same as the ILL staff. (See Fig. 9)

Datum: 17-08-1984

NCC-ISL AANVRAAG nr. 22849.0508
Id. DERO

Aanvrader:
Technische Hogeschool Delft
Bibliotheek, afd. PTT
Postbus 98
2600 MD DELFT
t.o.v. H. V. D. GEIN

Wilt u de volgende publicatie sturen (copie)
library technology reports, a service to provide information on
library systems equipment and supplies to the library profession. -
Chicago : als, 1965-
ISSN 242586= library technology reports (1965-)

Gevraagd id/m/j Jan 1984
auteur A. M. GROSCH
artikel THE IBM PERSONAL COMPUTER.
bladz. 161 - 84
aanv.inf. DEMO REQUEST

Uw bezit: 13548 J1945.V0001-J...

.....

NCC-ISL ANTWOORDBOM

aanvraag nr. 1 22849.0508
id. 1 DERO

De gevraagde publicatie	kan niet worden toezestuurd:
is aan de aanvrader toezestuurd:	
(1) ☐ origineel	(5) ☐ niet aanwezig
(2) ☒ copie	(6) ☐ niet beschikbaar
(3) ☐ microfiche/microfilm	(7) ☐ uitlezend/bij de binder
(4) ☐ overis	(8) ☐ wordt niet uitlezend
	(9) ☐ bibliografisch onjuist

s.v.p. aankruisen wat van toepassing is

Fig. 9 The request-form as printed at the library selected, showing the same request-number as in Fig. 6

As will be clear, all information on fulfillment of the requests must be given to the system, not only for statistical purposes, but to tell the NCC if it has to look for another library or not. Answer is given to the system by typing the request-number followed by a comma and a code-number ranging from 1 to 9.

Codes 1 to 4 tell the system that the request has been fulfilled; codes 5 to 8 that this is not the case, and that another library must be asked; code 9 is to tell the NCC that something is wrong with the request, for instance, the article is not in the journal. In this case, and also when the expiration date is reached, or no library answered positively, a message is sent to the requester to tell him. On the other hand if a library does not answer within a given period of time, two or four weeks, an overdue message is sent.

8. Statistics and improvements

Any system like this one offers a lot of statistical possibilities. But one has to be very careful with this information, especially because much of it is about other institutions' performances. Each month some overall statistics are produced now, together with the total number of ILL requests handled by each library connected online. Also the overall performance of the system is measured regularly, by means of measuring the duration of stay of the requests in the system before they are answered positively. The major reason for producing these statistics is to trace the bottlenecks in a quantitative way, and to confront the librarians involved with actual quantitative figures on the performance of their libraries, be it good or bad.

The first improvement in the ILL realised already is that from now on the requester always gets an answer. The second is that any request can be traced at any time in the system, as long as some information is known, like the request-number or the ILL number of the requesting library.

9. Status and future plans

The NCC/IBL system has been operational for over one year now, and over 70 libraries have an online connection, most of them by dial-up links.

About 12.000 requests were counted as being put into the system monthly. In the future this will grow to over 30.000 per month, but first the loading of over 3 million monograph titles, with holdings, has to be done. This is planned to start at the beginning of 1985. At the same time there is an effort to increase the number of libraries with online connections in order to decrease the delay caused by sending forms by post.

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PROBLEMS AND TRENDS IN R&D INFORMATION SUPPLY IN DENMARK
WITH SPECIAL CONSIDERATIONS ON INTERLENDING
AND DOCUMENT DELIVERY DEVELOPMENTS

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1. R&D information supply resources in Denmark - a general background *)

Denmark is a small country both in area and population. The Danish language is spoken by slightly more than 5 million people (but understood, with more or less difficulty, by probably some 10 million more). Danish scholarly and scientific literature (books and periodicals) only make up a small proportion of the acquisitions and collections of Danish academic libraries.

Until the mid-1960's there were only two universities in the narrower sense of the word (i.e. with all or most of the traditional faculties), and all institutions of higher education, such as the Danish University of Technology, were located either in Copenhagen (the vast majority) or in Århus. Consequently only a few, small research libraries were to be found outside these two cities. Since then new universities have been established in Odense, Roskilde and Aalborg and a university level research institution (with occasional post-graduate students) in Esbjerg. These institutions all have new and reasonably well-equipped libraries.

The three largest universities (Copenhagen, Århus and Odense) are served by libraries which are not part of the universities and the funding of these libraries is not the responsibility of the Minister of Education (to whose ministry the universities belong), but comes under the Minister of Cultural Affairs.

All major Danish research libraries are open to the general public with no other restrictions than those also imposed on students and academic staff. Some of these libraries, such as the library of the Danish University of Technology (The National Technology Library of Denmark) and the library of The Royal Veterinary and Agricultural University provide more loans to users from outside their institutions than to internal users, and about 40 % of the loans issued by The State and University Library in Århus are interlibrary loans to public libraries.

*) The "state of the art" part of the present paper is an abbreviated version of the Danish contribution to the SCONUL/SCANDIA meeting in March 1984 by M L Vig and A Winkel

With the exception of the two newest (and smallest) universities and the commercial colleges, all major university institutions have their own rather comprehensive departmental libraries, especially in the fields of science and technology. These libraries are generally independent of the main library (the university library) serving the institution. During the last few years, however, the importance of these departmental libraries has been declining owing to lack of funds.

1.1 Structural problems

The Danish research library system is the result of a historical development rather than of any rational plan. Its basic - and so far insoluble - problem is the fact already mentioned that the libraries have different department affiliations, that is, are under different Ministries. This means that any overall planning is extremely difficult and that the funding of the most important university libraries is not the responsibility of the universities themselves, nor even of the Ministry of Education.

As a consequence of this, there is a strong need for a joint body which can coordinate the activities of, and regulate the mutual dealings between, the academic libraries. Nevertheless no such body was established until 1970, and the Advisory Council which was set up that year with the National Librarian as its chairman, was not invested with authority to enforce its decisions. The Council has, however, initiated a great many projects, the most important of which was the shared cataloguing project called SAMKAT, see below.

The Advisory Council also set up a policy committee ("Målsætningsudvalget"), which in 1974 put forward a proposal for a more powerful and especially a better funded organization, which was unanimously adopted by the Advisory Council. However, before further steps towards implementation could be taken, the Minister of Cultural Affairs decided to appoint a library commission, which was charged with the task of examining the whole Danish library system - including the public libraries - and of drafting a proposal for the future administrative structure.

The idea of a joint directorate for research and public libraries was introduced, but was violently opposed by most research libraries and by universities, mainly because the proposal implied that a number of libraries hitherto integrated in institutions of higher education were transferred to the Ministry of Cultural Affairs, and because it was to be feared that the function of the research libraries as suppliers of special literature to the public libraries would be given a higher priority at the expense of the service to the primary users, students and academic staff.

A prolonged and heated debate followed, and shortly afterwards when a new, non-socialist, government came into office, the idea of merging the two library sectors was dropped. Instead a bill solely concerning the public libraries was passed and a solution to the problems of the research libraries was once again postponed. In 1983, negotiations were, however, opened between the two ministries (Cultural Affairs and Education) and we are back to where we started ten years ago: a proposal for a small administrative unit, combined with an advisory council and headed by a national librarian, who is not at the same time the director of any library.

1.2 Activities and resources

The following is a brief summary of the main trends:

- Activities on the whole have increased, whereas the real value of the grants has been reduced by about 6 % in 1973-82 (the expenditure, of course, being determined by the grants). There has been a small increase of staff, (less than 10 %). This should be compared with the increase of lending activities (55 %).
- Salaries have increased their proportion of the total expenditure from 57 % to 62 %, whereas books and periodicals plus binding has gone down from 28,5 % to 23,5 %. This, of course, is explained by the fact that the number of persons employed has increased, while the real value of the grants has decreased.
- The book account has had to bear the brunt of the budget reduction and, in addition to that, pay for the increase of staff. The shortage when the development of the total expenditure is compared with the inflation rate 1973-1982 is about 20 million dkr. or 6 %, but the book account is 40 million dkr. short of what it would be expected to be according to a normal zero growth index.
- The libraries have evidently given a higher priority to periodicals than to monographs; only during the last two or three years has the total number of subscriptions gone down. The wisdom of this can be discussed, especially as interlibrary services tend to be cheaper and faster for periodicals than for monographs. Interlibrary services are particularly efficient if you choose to send photocopies of shorter articles instead of the original material, which has to be returned and which cost more in postage and handling.
- Finally we notice that the binding account is the first to suffer when grants decrease. In some libraries it probably serves as a kind of "buffer", but the general trend is to reduce binding more than proportionally to the reduction in acquisitions.

On the whole the financial situation of the Danish research libraries must be described as unsatisfactory, at the same time as the demands on their resources is increasing. The university libraries have tried to counter the decreasing value of their grants by cutting down the number of extra copies rather than the number of titles, and by avoiding particularly expensive books (and periodicals). The present government has given some indications that it wants to relieve the needs of the research libraries, and, in 1983, the grants of the big libraries under the Ministry of Cultural Affairs were raised extraordinarily by a total of 5 million dkr., earmarked for books and periodicals, and this grant has been maintained also in the 1984 budgets. The Ministry of Education has set up a committee to provide a better foundation for drawing up the budgets of the academic libraries; we hope that this measure will be followed up by an effective safeguarding of the library grants against attacks from the universities. This is especially needed in the case of the "main subject libraries", i.e. libraries which have undertaken the responsibility of providing other libraries with less frequently used titles within a special subject field, such as technology. These libraries act as a main library for the whole country within their fields. This system, which dates back to the 1930's, and was originally a division of work between the academic and special libraries in Copenhagen, is of a very pragmatic nature. As to the lending cooperation, tradition, and voluntary agreements serve as basis and a revision of the distribution of responsibilities is needed. Various proposals to restructure it radically (and partly also to base it on new principles) have all miscarried, mainly owing to disagreement between the libraries, but also because there was a general feeling that we had to wait for a clarification of the future overall structure.

2. The structure of R&D literature interlending in Denmark

2.1 National interlending

The idea of inter-library lending between all Danish libraries can be traced back to 1892. However, the first implementation of inter-library lending by statute in Denmark occurred in 1932, with the implementation of the Library Act of 1931. The act states that a local public library is under obligation to send requests to a county library, to procure for readers any books which it does not stock itself.

The obligations imposed on the county libraries in 1931, with regard to inter-library lending, have remained unchanged to this day. The county libraries, numbering 14, must lend, to the libraries in their areas, books which the libraries do not possess themselves, and which they cannot be expected to purchase. If the county libraries do not have the books, they are obliged to pass the requests on to the State Library in Århus. The public libraries in the Copenhagen area are, however, obliged to procure materials from the research libraries in the capital. Because of the above mentioned cuts, the research libraries have been forced to accept the fact that they can neither maintain the level of their service to the students and scientists on the one hand, nor to the public libraries on

the other. There has been a drop in the research libraries' lending to the public libraries in the period from the mid-1950's to the mid-1970's from nearly 30 % of total circulation to about 10 %, but this also reveals that the considerable growth of the public libraries during the same period extended their coverage, and thus provided relief for the research libraries.

In 1981, the figures of loans from the 30 largest research libraries to other domestic libraries were 277,000 out of 1,745,000 total loans. To this can be added an unknown number of photocopies. The satisfaction rate for located requests is considered fairly good - 80-90 %. The speed of supply within Denmark is 1-2 weeks, but differs of course from library to library. Normally, loans are free of charge and very often photocopies are delivered free too.

2.2 International lending through research libraries

Danish statistics show that about 40 % of the requests from foreign lending libraries are filled by sending photocopies instead of originals. More than 50 % of the Danish outgoing requests concern periodicals, and about 90 % of the periodicals requests appear to be within the subject areas of medicine, science and (especially) technology.

According to the same statistics, only 2 % (35,000) of all loans issued by research libraries (1,745,000) went to non-domestic libraries in 1981. As to the 30 largest research libraries, about 35,000 loans (including photocopies) in 1981 came from foreign libraries, and 56,000 from Danish libraries. Put in another way: about 40 % of incoming loans from other libraries were from abroad.

The majority of the lending libraries (about 90 %) are research libraries, but a rather high percentage of public libraries in Denmark (more than 60 %) borrow from other Nordic countries.

It is rather difficult to make precise statements about the choice of channels for obtaining material from abroad. However, many Danish libraries will prefer to send requests to loan partners in Sweden first, and then to BLLD. Another possibility is the country of publication.

3. Recent technological developments

Within this field, two trends may be observed: planning and establishment of centralized library systems on the one hand, and decentralized systems on the other.

A number of libraries have a rather long experience of computerized documentation services - especially within science and technology, and a few libraries have, since the late 1960's, built up files of bibliographic data. In 1979, the National Library of

Technology made an online catalogue operational, and by now several academic libraries have, or are introducing, online accessible catalogues of their collections. In the case of joint initiatives, computerization has been delayed, mainly due to lack of funds and acceptable standards.

3.1 The centralized systems

A national union list of foreign books acquired by more than 200 Danish research libraries has existed since 1901. Since 1983, the acquisitions from the latest years are accessible as an online catalogue (ALBA).

Since the mid-1970's about 10 Danish research libraries have catalogued to a shared system, now comprising about 300,000 records (SAMKAT). Because of poor financial conditions, the primary objectives of a large fully integrated system have not been realized. However, since January 1984, a satisfactory search system offers the possibility of online localization of documents from the holdings of Danish research libraries. The file also contains MARC-records from BNB and LC, in addition to the cataloguing facilities. This implies that information in the ALBA and SAMKAT databases can be retrieved with the same search system. How far the systems development could be extended, and how fast, are of course questions depending on finance. For 1984, about 9 million dkr have been allocated for the project, including maintenance and development.

Periodicals in the Danish research libraries are listed in the NOSP catalogue (Nordic Union Catalogue for Periodicals) appearing in microform at present, but change to online accessibility has been scheduled. In 1984, Danish postings from NOSP and the ISDS database will be transferred to the base of the shared system. Periodicals in the Danish libraries of science and technology, including the total holdings of the National Library of Technology are online accessible through ALIS, (Automated Library System) a computerized system developed by that library.

3.2 The decentralized systems

The fact that there has been a rather slow development of the shared system is probably one of the reasons why several individual library systems have been created during the last few years. Another is, of course, the fact that advances in technology have made it possible to run library systems on minicomputers.

The trend today is, either that a large or medium-sized library buys a mini and a software-package for its own purpose, or that several libraries share the expenses of investment and running of a system. Thus, two university libraries (the State and University Library in Århus and Aalborg University Library) have bought a Danish developed system (RC) for online cataloguing and searching based on minis, and a number of smaller libraries belonging to the Government administration are sharing one computer

using the same software. The above mentioned ALIS system offers the possibility for bibliographic searching of documents from several science and technology libraries in Denmark and other Scandinavian countries. The system contains, moreover, an operational circulation module and a document ordering facility integrated in the retrieval system. This means that users can order loans or photocopies online after having retrieved the items from databases, and that the orders will be printed out in the respective library for further handling.

ALIS is furthermore host for a NORDINFO project named SPOT (Catalogue of Scandinavian Periodicals Online in Technology) where data from the national union files covering journals in the fields of science and technology are to be merged into one database.

Another tendency is that interlibrary document delivery in an increasing number of cases will be achieved by means of telefax transmission of documents. Although rather expensive, this facility seems to meet the needs of users, especially in industry where the time factor may be critical.

About 1970, the first online documentation services were established within the field of science and technology. Now the majority of the academic libraries offer information retrieval and SDI services - even within the humanities and social sciences. Although there is a strong tradition in Denmark for free library services, requested searches in international databases are normally charged to the end-users or their institutions in order to recover a large part of the actual costs incurred.

3.3 Participation in international DOCDEL experiments

The National Library of Technology has, together with the Danish Diane Centre and the PTT, announced its interest in participating in the EURODOCDEL project - the planned document delivery service of EC documents - which is one of the 10 EEC financially supported electronic DOCDEL projects. (See article by Vernimb in this issue of IATUL Proceedings). The participation will consist of a selection of an appropriate document set and selection/organization of local mid-user groups. Furthermore, Danish participation in the joint EEC and ESA project, Apollo, appears likely. Like the other Scandinavian countries, Denmark is using BLLD quite a lot for interlending purposes, and documents are already telefacsimile transmitted. Therefore, the participation of BLLD as electronic archive in the Apollo project will be important in the Danish document delivery context.

4. The impact of the technological developments on the interlending and document supply system.

As mentioned above, a substantial part of the recent S&T references to the literature (and within the Scandinavian countries) is online accessible through a document ordering

facility of the National Library of Technology ALIS system. This is possible because of the system integration of the search and the circulation module, so that information about the accessibility of individual documents can be given to the user (e.g. number of copies of requested documents, number of copies available for loan or reserved for other users, etc.) The requests are regularly printed out from the computer with the bibliographic data copied from the catalogue records supplied with the user identification. If a requested document is already checked out, the user can make a reservation.

Orders for documents from libraries other than the National Library of Technology sharing the ALIS system, can be transmitted directly to local printers via the mail box facility.

To the user it will therefore be of little or no importance where the documents are physically placed. Especially in the case of photocopies the user will receive a copy of the document wanted, normally a few days after having ordered it online from his own terminal regardless of the supplying library's geographical location. If a delivery delay of some days is considered too long, the copy can be transmitted by telefacsimile with only a few hours' delay. At present all major S&T libraries in Scandinavia have appropriate equipment and many of the users most likely to demand this urgent service, i.e. users in industry and governmental institutions, have already got telefacsimile equipment within their organisations. In such cases the copies can be transmitted directly from the supplying library to the end user, as the ordering facility offers possibility for the library sending the requests to identify the user who is to receive the copy.

For the time being the ALIS system is the only one in Denmark (and Scandinavia) to offer an online ordering facility. However, there is no doubt that other library systems will contain similar facilities in a few years. Thus it could be mentioned that a mail box function is planned to be implemented in the Danish centralized system containing the ALBA and SAMKAT databases. After the user (the library) has put in an online order of documents from the system, data based on centrally stored catalogue records (MARC-records), combined with identification codes of the ordering library and the end user, are transmitted to the lending library for further handling locally, e.g. in local micros. Also requests on documents not localized in the central bases could be sent to a potential owner library via the mail box system and if necessary transmitted to another possible institution.

It is obvious that the very unequal level of the automation of the local library systems causes many problems for designing an effective and stable online ordering facility for the centralized system. A really user friendly ordering facility can not be established until it becomes possible to automatically transmit orders through the network of local databases and library systems (i.e. to switch requests from one system to another), but even this is

probably just a question of some few years. Such a facility is in fact operational abroad, e.g. in the LASER system in the London area. The next step could be not only the possibility of switching from one system in the national network to another, but also to systems in other countries. In the Danish context, at least as far as S&T information supply is concerned, there would be an obvious need to be able to switch requests between different Scandinavian library systems as well as of the possibility of further transmission to BLLD and some major continental libraries.

It is quite evident that such new technological devices will definitely affect traditional interlending procedures and give rise to more or less informal, but well established rules for national and international cooperation. An end user in a private enterprise or a public library located somewhere in the country will be able to localize a document, via his own terminal, in the database of a research library placed somewhere else in his own country or abroad; he is able to be informed of the availability of a loan or copy of the document, and can make an online order. It would then be rather user unfriendly and not very time or cost effective to maintain the traditional interlibrary lending system. The general reasons for maintaining the well defined interlending routes - the difficulties of localizing and tracing documents, of informing the requester of the current status of the request, of handling invoice and payment procedures - do not seem to be tenable. The computer use, on the contrary, facilitates such notifications and makes decentralization possible and desirable.

It has been maintained that the technological innovations within the interlending and document delivery area did not imply the introduction of very much new technology. This is of course a question of more or less broad definitions.

New technology or old technology, rediscovered or used in a new way, can be applied to existing routines, not changing them but improving them, e.g. producing better subject retrieval facilities. Other technologies can add new services to old ones, e.g. the above discussed facility of ordering documents directly after having retrieved their references as the result of an online search. There is no doubt that already such technological applications will have a considerable impact on our systems and the habits of our user communities.

Moreover, increases of storage density of information in "electronic form" and the improvements in the means of moving messages from one storage location to another, the ability to manipulate stored information and the trend of decreasing hardware costs, will change the existing patterns drastically. In the United States, computer hosts are offering access to full text databases in combination with local handling of data on micros and local mass storage on videodisc, which can be used also for storing high-resolution digitalized graphics and photographs.

Similar services will very likely be available in Scandinavia in the near future and will consequently reduce the demand for traditional loan services. The critical point will be the speed of supply and the economics of the different services. If it is advantageous to access the information by online search of whole text and downloading of requested parts of the documents, the user will, no doubt, take that option. Certainly, there will not be a market for this kind of document delivery service in all areas and again, medicine, technology and applied sciences will be in the forefront.

INTERLIBRARY LENDING IN SWEDEN

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Introduction

Sweden has a population of 8 million people. It is, however, one of the largest countries in Europe. It occupies an area of 449 750 km². The distance from north to south is 1574 km, or, in other words, it is as far from Gothenburg to Luleå as from Gothenburg to Italy.

The greater part of the library collections in science and technology consists of foreign language material, that is, literature in English, German, French, Spanish, Russian, Japanese etc.

The library system^{1, 2}

The Swedish library system is made up of academic libraries, governmental libraries, industrial libraries, public libraries and school libraries. All of these are concerned to a greater or lesser extent with information transfer in science and technology.

A central national organization with responsibility for the information provision of the country, Delegationen för vetenskaplig och teknisk informationsförsörjning (the Delegation for Scientific and Technical Information) was established in 1979. DFI is responsible for "overall planning and coordination and for R&D in the field of research libraries and information services".³ DFI has no directive powers, but issues recommendations and provides funds for library projects. A large part of DFI's annual budget of more than 20 000 000 SEK is devoted to funding research and development projects. The areas which have been given priority for the next five years include "Better Utilization of Existing Resources and Services" and "Document Delivery".

In the field of public libraries, Statens Kulturråd (the National Council of Cultural Affairs), is an organization of great importance in connection with policy formulation and funding.

Academic and research libraries

Academic libraries are open, not only to university staff and students, but also to users from the general public, industry, etc. This means that academic library collections can

be widely exploited by all sections of the community. The task of academic and other research libraries is primarily to support scientific research. These libraries, which are almost without exception funded by the State, can be divided into two groups: general libraries and specialized research libraries, according to the nature of their holdings.

The Swedish national library is the Royal Library in Stockholm, which grew out of the royal book collections of the 16th and early 17th centuries. The public probably had access to it as early as the middle of the 17th century. The special function of this institution is to collect, house and provide Swedish literature as completely as possible. It is under the direct authority of the Ministry of Education.

There are six university libraries, with large general collections:

Uppsala	-	established	1620
Lund	-	"	1666
Gothenburg	-	"	1891
Umeå	-	"	1963
Linköping	-	"	1969
Stockholm	-	"	1971 (based on a number of already existing departmental libraries and the library of the Royal Swedish Academy of Sciences).

The Royal Library and these six university libraries are legal deposit libraries. The Royal Library is the national archival collection and Lund University Library the back-up archive with responsibility for lending Swedish publications to foreign users. There are also smaller libraries at the university colleges, of Karlstad, Växjö and Örebro, established in the seventies and at 14 more recently established colleges.

The specialized research libraries provide service in particular fields, such as technology (the libraries of Chalmers University of Technology, Gothenburg, and of the Royal Institute of Technology, Stockholm), medicine (the library of the Caroline Institute of Medicine and Surgery, Stockholm) and agriculture (the library of the Swedish University of Agricultural Sciences, Uppsala).

In 1980, a committee was set up by DFI to investigate the possibilities of organizing a system of subject-specialized libraries. It is envisaged that such libraries, or networks of libraries should:

- offer reference services
- see that subject bibliographies are available and compile them if necessary
- be responsible for national contributions to international information systems
- act as intermediaries for grey literature

- oversee the acquisition of current literature and reference materials
- arrange interlibrary loans
- be responsible to users and other libraries for the availability of literature and photocopies
- be responsible for planning and development
- take initiative in the building up of new collections and databases
- take the initiative in developing co-operation on a national and international level.⁴

The Committee presented their report in 1983, and this has led to the establishment, in 1984, of this role for two libraries - the Library of the Caroline Institute of Medicine and Surgery for medicine and the Library of the National Board of Occupational Safety and Health for work environment.

Governmental libraries

There are a number of governmental agency libraries to which the public has access. Some of them, for example the Library of Parliament, the Library of the National Board of Occupational Safety and Health, and the Library of the National Defence Research Institute, are of great importance for research and studies.

Industrial libraries

The libraries of industrial firms and organizations vary greatly in terms of size, ambitions and standard. They have certain characteristics in common with the specialized research libraries, concentrating their collections to particular subject fields. There is, however, a great difference: these libraries exist in order to serve the organization to which they belong. The general public may use them only as an exception.

Public libraries

Public libraries and school libraries are as a rule funded by local authorities, although they get some support from the State through the National Council of Cultural Affairs. Public libraries have the ambition to serve all groups in society. Their aim is to make it possible for any individual to borrow the literature he may need for his education, his work or his recreation, without too many formalities and within a reasonably short time. Their role in scientific and technical information provision is of increasing importance.

The public library system has a hierarchical structure. The lowest level is made up of the municipal libraries. There is a public library in each of the 277 municipalities in the country, though there is no law requiring the establishment of libraries. The standard of these public libraries varies according to the size, economy and cultural climate of the municipality. The next level consists of the county libraries which were established in each of the 24 counties during the period 1930 - 1954. Their function is to supplement the

holdings of the smaller libraries and to help them to solve problems of library techniques, economy and organization. The highest level consists of the three lending centres, situated in the city libraries in Malmö in southern Sweden, Stockholm in the middle and Umeå in northern Sweden. It is their responsibility to locate and, if possible, provide any material that the lower levels within the region have not been able to supply. They are also required to build up literature collections in immigrant and minority languages and to assist with bibliographic and qualified reference work. One of the reasons for establishing the three lending centres was to reduce the pressure on the research libraries from the increasing demand for interlibrary loans from the public libraries.

Library cooperation

Swedish library cooperation functions well, within and between the different libraries, mainly on a voluntary basis. All libraries participate in the work as equals. The objective of the cooperation has been defined as follows:

"All libraries must - in practice if not in theory - form part of a unitary system, a system in which there is an unbroken line reaching from the school library, by way of the public library, to the research library."⁵

The spirit of cooperation finds expression in various ways, both formal and practical, through sharing of resources as in interlending, planned acquisition policies and shared research and development projects.

A number of union catalogues facilitate access to the collections held in Swedish libraries. The oldest union catalogue, *Accessionskatalog över utländsk litteratur i svenska forskningsbibliotek* (Union Catalogue of Foreign Literature in Swedish Research Libraries), has been published by the Royal Library since 1886. The public libraries have a corresponding catalogue in *Utländska nyförvärv till större svenska folkbibliotek* (Foreign Acquisitions of Larger Swedish Public Libraries). The first volume registered acquisitions made in 1948.

There are also union catalogues of a less comprehensive kind, such as *List Tech*, which registers foreign technical and scientific periodicals in larger Swedish special libraries. A number of subject based union catalogues of this kind are common for the Scandinavian countries, for example *List BioMed* in the fields of biology and medicine and *List Econ* in the field of economics.

The development of a computerized EDP-system - LIBRIS (LIBRARY Information System) during the seventies for the Swedish research libraries produced a useful tool for the location of publications. In 1984, 22 research libraries were connected to the LIBRIS computer in Stockholm, by means of a dedicated network. These libraries register their holdings online; in addition foreign acquisitions of some 100 research libraries plus the

Swedish national bibliography since 1976 are input into the LIBRIS database, which contains over a million records. Some 200 libraries make use of the LIBRIS dial-up facility, via teletype terminals and the PTT network.⁶

The public libraries make use of their own EDP system - BUMS (Bibliotekstjänsts Utlåningsutrustning och Mediakontroll-System) - a system which includes cataloguing, searching and circulation routines. The public library EDP system has, in a similar way to LIBRIS, facilitated location of publications.

Cooperative acquisition projects have also played a role in Swedish and Scandinavian library cooperation - the Scandia plan - in which responsibility was shared between the participants for holding literature covering different subject areas/ regions/ languages.⁷ An area of Swedish and Scandinavian library cooperation that has grown in importance during recent years is research and development. Both DFI and NORDINFO (the Nordic Council for Scientific Information and Research Libraries) have stimulated libraries to carry out cooperative projects of various kinds.

Cooperation is especially apparent in interlibrary lending, where there has been a steady increase in traffic due to:

- the constantly growing amount of published information
- the rising prices of literature
- the computerized information retrieval systems
- new user groups
- the decentralisation of higher education
- the redistribution of governmental agencies, formerly heavily concentrated to Stockholm.

The literature production of today, together with the rising prices, make it impossible for an individual library to keep up with the supply. Computerized information retrieval systems spread knowledge about documents that otherwise would not have been in demand. New user groups mean that libraries are used more intensively. Persons working at the new universities and the governmental agencies throughout the country apply to small, recently established, university libraries or to public libraries, which have to rely on interlibrary lending to serve these users. The result of this is that more and more emphasis is placed on the document delivery function.

Interlibrary lending

Interlibrary lending has traditionally been an area of great importance in Swedish library cooperation. Interlibrary lending in an organized form started as early as 1886. It was made possible by the fact that the Union catalogue was first published in that year. To begin with, cooperation was supposed to include only research libraries, but from the

beginning of the twentieth century the public libraries have taken part, although interlibrary lending was not an important part of their activities until the middle of the century. About this time the industrial libraries also began to make use of the interlending network.⁸

Traditionally, library services have been provided free of charge for the user, in accordance with the principle that information should be free and available to everyone, wherever he lives and whatever his status, economy and position in society. Interlibrary loans, or copies given as substitutes for loans, from Swedish suppliers, have in the majority of cases been provided free of charge. It was said, in 1961, that "Swedish interlibrary lending is characterized by a great generosity."⁹ Charges for certain library services are, however, planned for the research library section and a general recommendation concerning, amongst others, interlending charges has been issued by DFI in 1984.

Interlibrary lending can be organized in a number of different ways, such as centralized, decentralized or hierarchical systems. In Sweden there are two interconnected systems, one for the research libraries and the other for the public libraries. The present organization of interlending is based on guidelines set out in 1979.¹⁰ A comprehensive interlending manual describes current practice.

The research libraries have a decentralized interlending system. The country is divided into six regions, and each of the six large general research libraries has the responsibility for literature provision in one of them. In the Stockholm region the responsibility is divided between the Royal Library and Stockholm University Library. This form of regionalization is applicable also to the specialized academic libraries. The purpose of the regionalization is to distribute the work burden as equally as possible and to make sure that the collections of the smaller libraries are used as well as those of the larger ones. Requests can be passed on from one library to another. The system is not homogeneous but contains elements of a centralized character in the form of specialized collections with a responsibility for the whole country.

The system of the public libraries is more hierarchical. The interlending requests of the public libraries follow a chain consisting of up to five links - from a branch library to the main library of the municipality, from there to the county library, then to the lending centre and from there to a research library. Public libraries should, however, make use primarily of other public libraries, and only if the requested document is not available inside the public library system should they apply to the research libraries.

Extent of interlibrary lending

The interlibrary lending traffic to and from the large research libraries comprised about 60 000 volumes a year in the early fifties.¹¹ Since then it has grown considerably. In 1980, the interlibrary loans from the 15 largest research libraries were 290 000, of which 113 000 (39 %) were original documents and the remainder copies.¹² This should be compared with the number of local loans, about 1.4 million. Interlibrary loans make up approximately 21 % of the total amount of transactions.¹³ Some 35 % of these transactions go to other large research libraries, 11 % go to public libraries, 11 % to foreign libraries and the remaining 43 % to industrial libraries, governmental libraries, branch organizations etc. The number of documents borrowed by the 15 largest research libraries, during the same period, was 132 000.

About 800 institutions of all library categories participate in the interlending traffic, to a greater or lesser extent. The large research libraries, both the general and specialized, deliver more material than they request. Various streams of requests and material can be distinguished. The main streams flow as follows:

- between the research libraries
- between specialized research libraries and industrial libraries with the former as the giving party
- between public libraries, with lending centres and county libraries as giving and municipality libraries as the taking parties
- between research libraries and public libraries, mainly county libraries, with the research libraries as the suppliers.

The various library categories request and deliver various types of literature. Research libraries normally want foreign language material, more often periodicals than monographs. This tendency is very pronounced among specialized research libraries and even more among industrial libraries. Specialized research libraries and industrial libraries are interested mainly in recently published literature. The public library requests are mostly for monographs and are rather evenly distributed between Swedish and foreign languages. The deliveries from general research libraries consist, to a great extent, of foreign monographs. Specialized research libraries deliver mainly foreign periodicals. Lending centres and county libraries predominantly provide monographs in Swedish.¹⁴

Efficiency of the service

According to an investigation from the early 'seventies, almost 90 % of all interlibrary lending requests had a positive result. Most of them were delivered without delay, but in about 10 % of the cases the user had to wait for a shorter or longer period, because the material was not immediately available.¹⁴ Later investigations have indicated a somewhat less satisfying situation. In 1980 an investigation on deficiencies in the literature supply in the Nordic countries, financed by NORDINFO, showed that some 70 % of

requests could be satisfied by Swedish libraries.¹⁵ Unfortunately some important libraries within the fields of science and technology did not take part in this study and this makes interpretation of the results difficult. There are indications that within the fields of science and technology and medicine a much smaller proportion of material can be supplied from Swedish sources. One investigation, carried out in 1982, found that some 65 % of requests in science and technology could be filled from Swedish sources (71 % satisfaction for journal articles, but only 29 % for conference papers).¹⁶

Both subject field and document type are important factors in the possibility of obtaining publications from Swedish sources. An example of the effect of subject can be seen in the recent statistics on interlending from the university of Lund where 11 % of the loans to the branch library for science, medicine and technology came from BLLD, whereas the corresponding figure for the main library which holds humanities, social sciences and theology was 4 %.³

Relative reductions in budgets for the purchase of literature, due to rising prices, devaluation of the Swedish kronor and rising dollar rates, have resulted in the buying of fewer monographs. Periodical holdings have been maintained at the expense of other publications. A recent investigation of the supply of medical literature showed that out of 4 500 recently published medical monographs, only 1 000 (22 %), were acquired by Swedish research libraries. 41 % of requests for medical monographs could not be satisfied from Swedish sources (the corresponding figure for periodicals was 15 %).¹⁷

Persson, in a study published in 1983, investigated Swedish library holdings, in a number of subject fields, with respect to monographs registered in the British National Bibliography, BNB, and the Cumulative Book Index, CBI.¹⁸

<u>Subject</u>	<u>BNB 1981</u>	<u>CBI 1981</u>
Physics	61 %	50 %
Technology	29 %	28 %

It can be seen that coverage within technology is rather low. Today, it is impossible to keep up with the literature production, not only for individual libraries, but also for individual countries. International cooperation is necessary. For a long time Sweden has had interlending connections with other countries, mainly the Scandinavian countries. Since the Second World War, Great Britain has become the most important partner outside Scandinavia. For this interlending traffic with foreign countries the rules which have been laid down by IFLA hold valid.

Recent developments

The ever growing volume of published information, particularly in science, technology and medicine has led to increasing efforts to improve interlending and document delivery routines.

In 1979 DOCLINE - a computerized interlending link - was introduced between the British Library Lending Division and Chalmers University of Technology Library, Göteborg.¹⁹ In 1981 this online ordering and communication link was tested by seven libraries of different type and size - university, governmental institutions and industrial companies - with regard to satisfaction rate, speed of delivery and costs.²⁰ DOCLINE was found to be a cost-effective form for document ordering to a large supplier and as a result the system was made available to libraries throughout Sweden. At the present time some 50 libraries make use of the online system. The original system is being developed to include other suppliers than BLLD, for example Studsvik Energiteknik AB for report literature. Microcomputer-based routines allow libraries to input requests from a local offline file to a central node. DOCLINE produces statistical and administrative information - for example the number of times a given title is requested, the satisfaction rate for different types of literature etc. DOCLINE is now being extended on a trial basis, in a NORDINFO supported project, to a number of libraries in Denmark, Finland and Norway.

Another online ordering system specially for report literature is RECODEX, developed by the Library at Studsvik Energiteknik AB.²¹ RECODEX permits online ordering, by report number, from a Nordic report database which specializes in energy and environmental information.

Yet another online ordering system has been developed during the eighties by the Library of the Medical Information Centre, Caroline Institute for Medicine and Surgery, Stockholm. This system is directed towards the online ordering of medical publications to which references have been obtained via the MEDLINE system. This system has been tested by some 200 users during an experimental period in 1983.

The Nordic university of technology libraries are at present engaged in cooperative production of union catalogues for both periodicals and monographs, and the use of online ordering routines associated with ALIS - Automated Library System. (See article by Winkel in this issue of IATUL Proceedings.)

Finally, preliminary discussions have been held concerning planning and development of online ordering routines for LIBRIS.

It seems reasonable to suppose that there will be a gradual merging and cooperation between a number of these online systems in the future.

In 1982 Chalmers University of Technology Library and BLLD began a series of experiments on the telefacsimile transmission of documents in response to "urgent" requests. These studies subsequently led to the introduction of BLLDs European telefacsimile service. There is at present a small but regular demand for rapid document delivery by telefacsimile, with a latent demand amongst certain user groups, for example industrial users and academic researchers. During 1983 and 1984 the university of technology libraries in Denmark, Finland, Norway and Sweden have established a telefacsimile network for rapid document delivery.

Recent developments can be summarized briefly - considerable efforts to develop online ordering routines, and the possibility of rapid, but expensive, document delivery via telefacsimile. There is, however, a need for a reasonably fast, efficient, low-cost document delivery system and there is, therefore, considerable Swedish interest in the APOLLO project where full text transmission of documents will be achieved with the help of the second flight unit of the European Communication Satellite (ECS-2/SMS).

Recent developments in interlending and document delivery in Sweden have been supported and stimulated by DFI's Working Group for Interlending. This group composed of representatives from DFI and academic, public and industrial libraries, has worked with such questions as standardization, interlending manuals, online ordering systems, the use of new technology for interlending and continuing education for library staff. In 1984 the first Swedish conference for Interlending was organized by the Swedish Association of University and Research Librarians supported by DFI, and it is planned that this will be an annual occurrence.

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A PROPOSED MODEL FOR INTERLIBRARY LENDING IN CHINA

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Introduction

The proposal of a reasonable model for interlending in China is a complicated problem. First, there is a lack of basic statistical data for demand and performance of existing interlending activities. Secondly, China is vast in area and population. The distribution of population and industry is uneven in the country. Thirdly, there are enormous industrial, educational and research and development systems. As a result of all these factors the library and information system is comprehensive and complicated.

The Population of China and its Distribution

China has a total land area of 9.6 million square kilometers. It is a multi-national country, peopled by 56 ethnic groups. The population of the country, according to the recent census figures, on 1st July 1982 was 1,031,882,511. Because of complex natural conditions, the population distribution in China is quite uneven. Population density varies strikingly, with the greatest contrast occurring between the eastern half of China and the lands of the west and the northwest. The eastern part of China is densely populated while the extensive western and frontier regions are all sparsely populated.

Administrative Divisions

China is divided for administrative purposes into 22 provinces, 5 autonomous regions and 3 municipalities directly under the central Authorities (Fig. 1).¹

The administrative units under a province or autonomous region include cities, prefectures and counties and autonomous counties. The total number of counties in China exceeds 2,000. The 22 provinces are: Hebei (Shijiezhuan)*, Shanxi (Taiyuan), Liaoning (Shenyang), Jilin (Changchun), Heilongjiang (Harbin), Shaanxi (Xi'an), Gansu (Lanzhou), Qinghai (Xining), Shandong (Jinan), Jiangsu (Nanjing), Zhejiang (Hangzhou), Anhui (Hefei), Jiangxi (Nanchang), Fujian (Fuzhou), Taiwan, Henan (Zhengzhou), Hubei (Wuhan), Hunan (Changsha), Guangdong (Guangzhou), Sichuan (Chengdu), Guizhou (Guiyang), Yunnan (Kunming).

* The name of the city where the local government of the given province or autonomous region is seated is given in brackets.

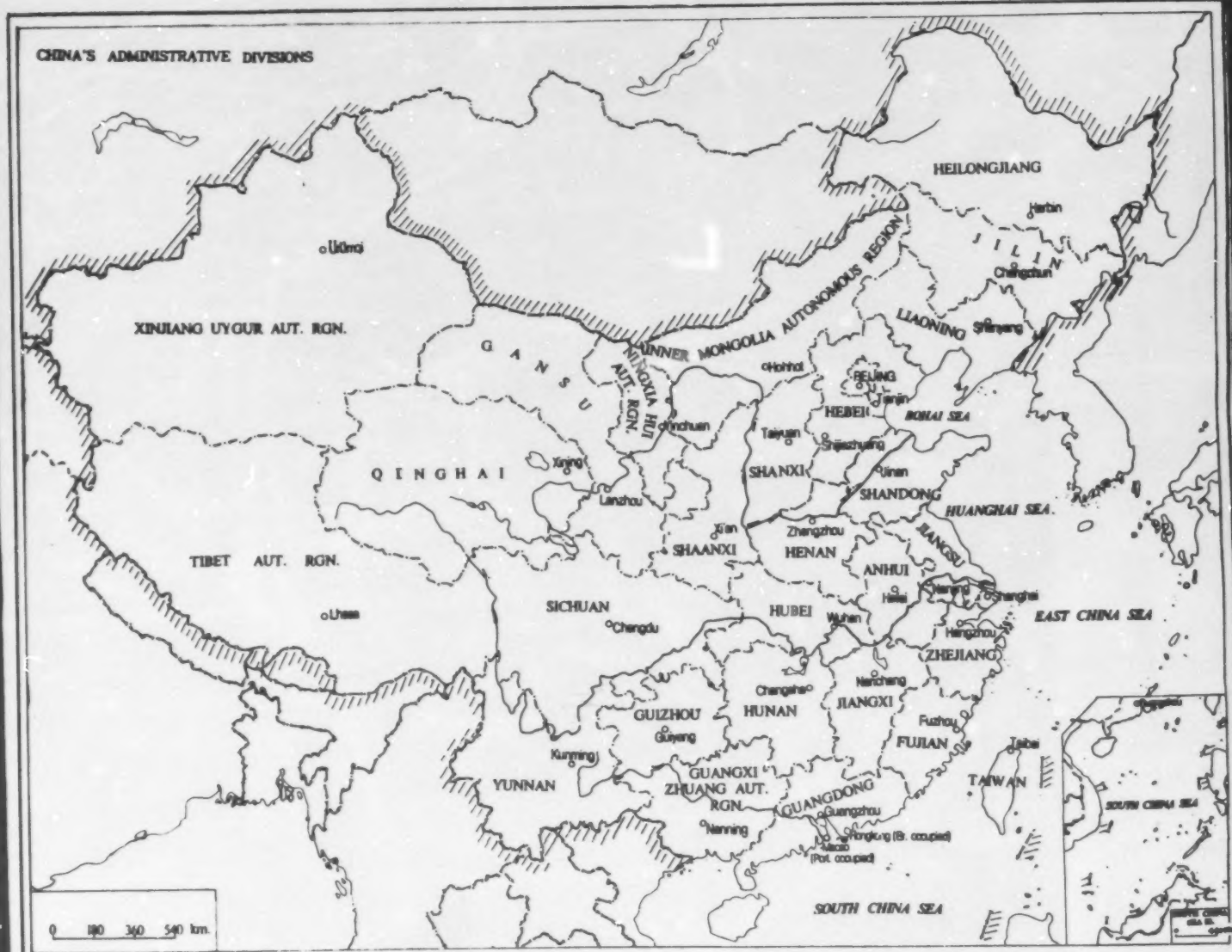


Fig. 1 China's Administrative Divisions

(Source: China: a general survey, Beijing, 1979)

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The 5 autonomous regions are: the Inner Mongolia Autonomous Region (Hohhot), the Ningxia Hui Autonomous Region (Yinchuan), the Xinjiang Uygur Autonomous Region (Urumqi), the Guangxi Autonomous Region (Nanning), and the Tibet Autonomous Region (Lhasa).

Beijing, Shanghai and Tianjing are the three municipalities directly under the Central Government.

In general, China as a whole can be divided into 7 big regions. They are:

1. The northwestern region: the provinces of Shaanxi, Gansu and Qinghai and the Xinjiang Uygur Autonomous Region, the Tibet Autonomous Region and the Ningxia Hui Autonomous Region.
2. The northeastern region: the provinces of Liaoning, Jilin and Heilongjiang.
3. The northern region: the provinces of Hebei, Henan, Shanxi and Shandong and the Inner Mongolia Autonomous Region.
4. The eastern region: the provinces of Jiangsu, Zhejiang, Anhui, Jiangxi and Fujian.
5. The central-south region: the provinces of Hubei, Hunan and Guangdong, and the Guangxi Autonomous Region.
6. The southwestern region: the provinces of Sichuan, Guizhou and Yunnan.
7. The southeastern region of east China: Taiwan province.

Transportation

Transportation has been steadily advancing in the new China. Railways are the mainstay of China's transport network, constituting a great proportion of the nation's total volume of freight turnover. By 1978, the length of railways in service was over 22,000 km while the total road network open to traffic was 890,000 km. ²

China's civil aviation has been making steady progress in recent years. Over 100 domestic air routes fan outwards from Beijing to 80 large and medium-sized cities as well as remote regions and border areas. There are direct air routes between Beijing and each province, municipality and autonomous region, except Taiwan province. Scheduled daily flights are available between Beijing and Shanghai, Guangzhou, Kunming, Chengdu, Shenyang, Changchun, Changsha, Wuhan, Zhengzhou and Harbin. An airline network covering a total of 148,900 km has been built up. Over the Tibet Plateau two air routes -

Chengdu-Lhasa and Lanzhou-Lhasa - were opened in this former "forbidden zone for aviation".³

Xinjiang with its vast area has developed its civil aviation most rapidly. The principal means of transport used to be camels and donkeys. Now a highway network and airline routes have been established, with Urümqi as centre.

Libraries and Information Centres

There are four types of library in China's library network: public libraries, university and school libraries, research libraries, and ministry, large enterprise and other special libraries:

1. Public libraries: At present there are 1,700 public libraries operating at different levels in China. They are under the direction of the Library Administrative Bureau, belonging to the Ministry of Culture. There are libraries at every administrative level, from the state level through province or autonomous region and city to the county level, even to district and commune level. (Fig. 2).

Among them the National Library of Beijing is the largest. The Shanghai Library is the second largest, and the Nanjing Library the third. (See following subsections for some details).

2. University and school libraries: All institutions of higher education and schools have their own libraries. Among the university libraries the foremost are Beijing university, Nanjing, Wuhan, and Fu Dan and Jiao Tong in Shanghai.
3. Research libraries: These libraries are mainly under the management of the Academy of Sciences of China and its research institutes. The Library of the Academy of Sciences of China in Beijing is the central research library.
4. Ministry, large enterprise and other special libraries: The libraries in this system range from those of the state ministries or large enterprises to those in factories or other units. The ministerial libraries are sometimes on a large scale. China's scientific and technical information work has been developed in a planned way since 1956. There are four lines of information in China, forming an information network. They are as follows:

1. The central information centre: the Institute of Scientific and Technical Information of China (ISTIC) with its Chongqing Branch is a national and comprehensive information institution. (Fig. 3)

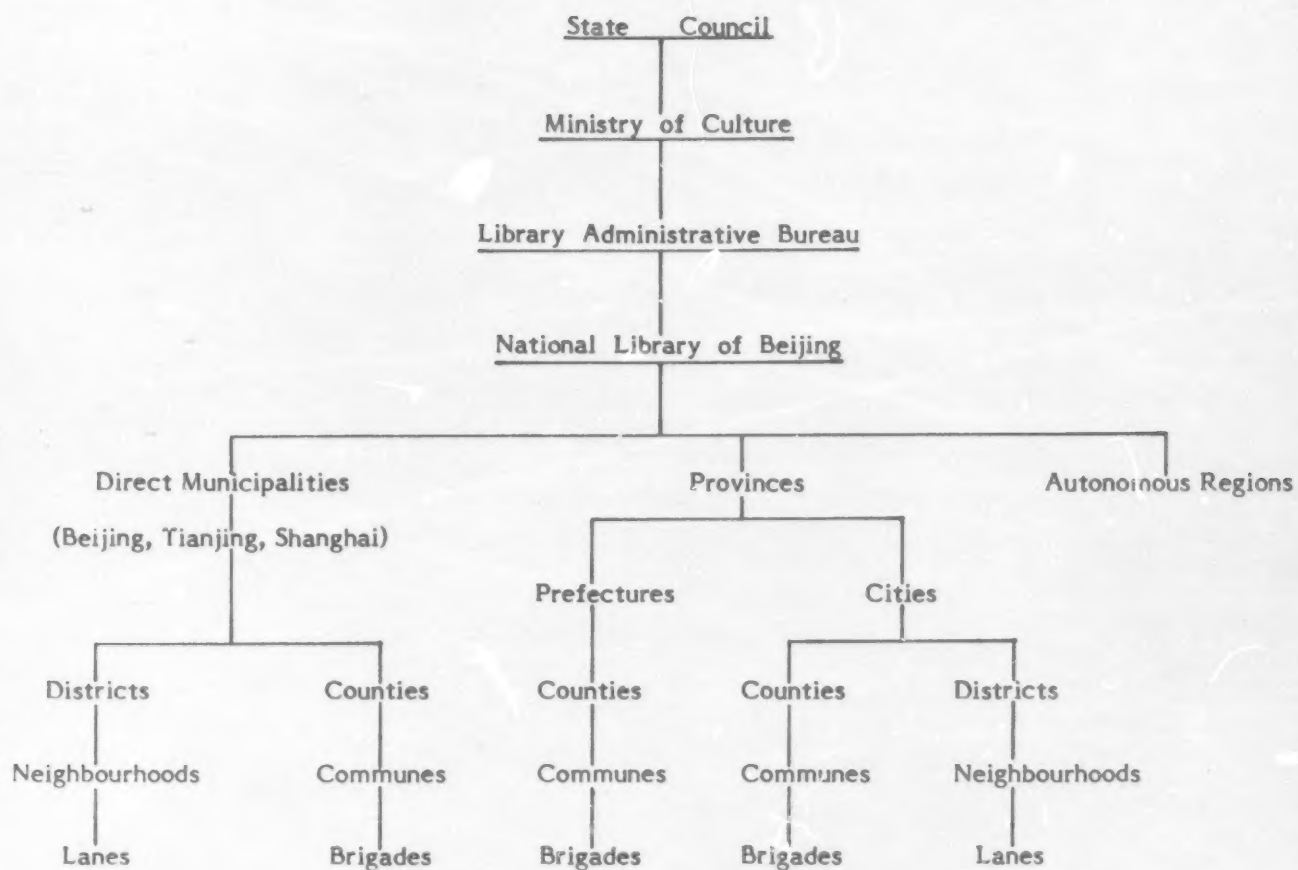


Fig. 2 The Structure of the Public Library Service
(The Autonomous region has the same structure as the province.)

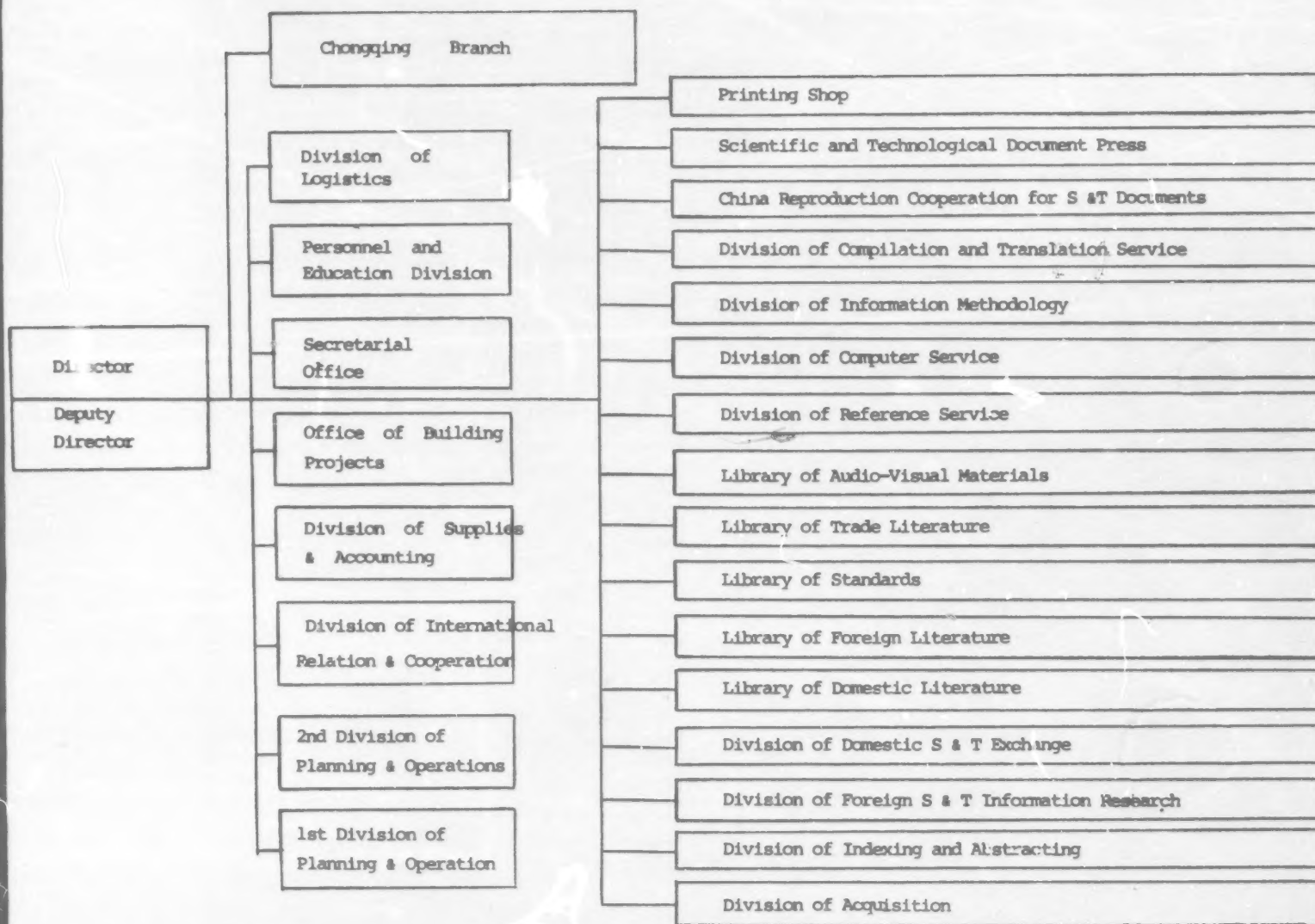


Fig. 3 The Structure of the Institute of Scientific and Technical Information of China

2. Province, autonomous region, municipality, prefecture and county information centres: Each is under the direction of the local commission of science and technology.
3. Research information centres: They belong to the institutes under the Academy of Science of China.
4. Ministry, large enterprise and other special information centres.

Sometimes universities and colleges have their own information offices but they are usually on a small scale.

Among the major information centres and libraries, the following have played more important roles in the national library and information field. They are:

1. The Institute of Scientific and Technical Information of China (ISTIC) in Beijing

ISTIC is a comprehensive information institution for science and technology, and functions as the national information centre in science and technology.

Its principal tasks are: ⁴

- a. To collect, selectively, scientific and technical information material at home and abroad, including research reports, conference proceedings, periodicals, patent literature, standard material, product catalogue and samples, abstracts and indexes, translations and audio-visual materials;
- b. To process the materials acquired and report them to users, as well as to produce information publications with emphasis on reporting the major achievements and development trends in the field of science and technology at home and abroad;
- c. To offer referral, translation and retrieval services as well as open-shelf and closed-shelf services and reprographic services of its collections;
- d. To conduct information analysis and research with the aim of supporting policy-making in science and technology and problem-solving, which are interdisciplinary and widely concerned in China's national economic construction;
- e. To collect plans and findings of major research projects all over the country and undertake exchange of the achievements;

- f. To carry out theoretical and applied research on information science and methodology as well as to develop modern information technology;
- g. To organize the compilation of information textbooks and vocational training material and the education and training of the professionals in scientific and technical information;
- h. To coordinate, and provide guidance for, the work and activities of various scientific and technical information institutions, at a national level, under the leadership of either the ministries of the central government or the local government;
- i. To develop international exchange and cooperation in the field of scientific and technical information.

Acquisitions and holdings:

By the end of 1980 the total size of the collections in the ISTIC were: foreign periodicals 12,700 titles accumulated since 1968; foreign literature (mainly research reports, conference proceedings and dissertations, etc.) 700,000 items; patent specifications 7,000,000 items; standards 300,000 items; foreign product catalogues 350,000 items; Chinese periodicals 4,000 titles; Chinese literature 200,000 items; microforms 1,000,000 items; reference books 35,000 volumes; scientific and technical films 1,200 programmes.

The extent of acquisitions in 1980 divided into: foreign literature 37,000 items; foreign periodicals 9,100 titles; standards 30,000 items; patent specifications 710,000 items; Chinese literature 130,000 items; Chinese periodicals 4,000 titles; product catalogues 150,000 items; scientific and technical films 107 programmes; video tapes 241 programmes and reference books 2,000 volumes.⁵

The Chongqing Branch of ISTIC is also a comprehensive information institution for science and technology, and acts as an information centre for the vast south-west China.

The major tasks for the Branch are as follows:

- a. To acquire, collect and catalogue the significant periodicals and literature of science and technology in foreign languages and in Chinese;
- b. To compile and publish some 35 titles of abstracting and indexing magazines and translation periodicals;
- c. To provide referral and reprographic services locally and at a national level;

- d. To educate and train the information professional mainly for the south-west part of China.

As for its acquisitions, the Branch's annual intake of foreign periodicals, for instance, amounts to over 6,000 titles.

2. The National Library of Beijing

The predecessor of the National Library was the Metropolitan Library of Peking founded at the end of the Qing Dynasty (1910) and formally opened in 1912. It was renamed as the National Library of Peiping in 1928. Although the Library has a history of only seventy years, the foundation of its collections dates back 700 years.⁶

With regard to collections, by the end of 1981, the Library had 11,000,000 books, periodical issues and other items. The total collections comprise:

Books: over 5,570,000 volumes, accounting for more than half of the Library's collections, 60 % in Chinese, 40 % in foreign languages.

Periodicals: over 4,470,000 issues, comprising about 4/10 of the Library's collections, 20 % in Chinese. Of the 18,500 and more current Chinese and foreign periodicals received, 80 % deal with natural sciences and engineering technology, 20 % with social sciences.

Newspapers: over 3,600 titles and more than 70,000 monthly bound volumes. 50% each in Chinese and foreign languages.

UN Materials & Government Publications from certain countries: over 280,000 volumes.

Special collections: over 600,000 volumes, including about 280,000 rare revolutionary documents and handwritten and wood-block-printed copies handed down through the dynasties.

Furthermore, the Library has maps, pictures, rubbings made from inscriptions on stone tablets or bronze vessels, oracle bones, manuscripts of famous authors, microfilms, microfiches, etc.

3. The Library of the Academy of Sciences of China

The Library was established in 1951. The academy is located in Beijing where it has its central library. Within the administration there are about 140 institutional and five regional libraries. The central library in Beijing coordinates the network of these libraries. By the end of 1979, the total collections of the library network exceeded 4.5 million items in both Chinese and foreign languages.

4. The Shanghai Library

This is the second largest public library in China with more than 6 million books in 1979. There are over 41,000 registered borrowers. The daily circulation is over 6,500 items. Since Shanghai is the biggest industrial city in China, the collections are strong in science and technology.

In addition to these, another establishment to be noted is the China National Publications Import Corporation (CNPIC) which was founded in 1949, but has had its present name only since 1972. It has the assignment to control and manage all imports of printed materials, microforms, records, and tapes. Therefore, CNPIC has a unique position in the provision of information in that it is in charge of virtually all foreign currency available for the acquisition of literature. It has a central office and 28 provincial and municipal branch offices.

The Need for an Effective Interlending System

China is one of the developing countries. One of the common problems in research and development in such countries is the inadequacy, in various degrees, of physical access to the information and literature which users want. Furthermore, because of the vastness of the territory, the information and library resources are now to some extent unevenly distributed in China. As a result, users distant from major information centres and libraries have difficulty in obtaining the literature they want, especially the foreign material. Therefore, to serve the remote users by an effective interlending system should be considered as an important aspect for libraries and information centres in China.

In some cases, even a user who lives near a big city, will still need to go there by himself, to look for literature. Recently, a researcher from Tienjing, the third biggest municipality of China and only some 200 km away from Beijing, told me that he sometimes had to go to Beijing by train, to search for material in the ISTIC. In this case, in fact, other aspects of the library service were also involved, but an interlending service would have been a major factor concerned.

In interviews with some 20 Chinese scientists and engineers, 6 or 7 of them expressed the opinion that at present they have to make more effort to get the actual literature than to obtain the references for it.

The author himself feels that when relevant references are at hand, but the relevant literature is unavailable, great frustration would be felt. To end this description I would like to quote a statement by E.S. Smith and M.B. Line: "Much work is now being carried out on the development of information services, some of them computer-based and most of them costly. The effectiveness of these is going to be severely limited unless there is developed in parallel - if possible in advance - a document provision service for the references retrieved. Otherwise a good deal of money will be spent with the end result of yet more frustrated users".⁷

Interlending Activities

The national interlending system in China is, due to the size of the country and its population, rather complex. It is partly based on the library systems of the public libraries, the Academy of Sciences' libraries and college and university libraries. Various coordinated local library organizations and information agencies exist, however, to develop interlibrary loan services in the provinces. Participation in interlending is voluntary and based on the needs of the libraries concerned.

1. Brief history

The interlending loan service in China began in the National Library of Peiping (the former name for the National Library of Beijing) in 1927. During the early 1930s a number of libraries such as Nan Kai University in Tienjin, Jin Ling (Nanking) University, the Library of Chinese National Literature, the Central Institute for Research in Shanghai, Wen Hua College for Library Science in Wuhan and more government organizations began to cooperate, but during the period 1937-1949 the effects of war resulted in a stop in interlending activities. "In the 1950s China entered a period of more settled economy. The basis of an interlending system was formed by the establishment in 1957 of the First and Second National Central Libraries (National Library of Beijing and The Library of Shanghai) and also the Regional Central Libraries. Unfortunately, the 10 years Cultural Revolution caused a series of setbacks, and it was not until 1976, with a favourable turn in the economic and political climate, that the interlending loan service regained its vitality".⁸

2. Existing patterns of interlending

In general, there are now three patterns of interlending in China. They are:

- (1) Centralized supply by the National Library of Beijing (NLB): The National Library has established interlending relations with 814 provincial and municipal libraries, scientific research institutes, industrial firms and college and university libraries. The crucial role played by the NLB in achieving resource-sharing is based on the following:
 - "a. Acquisition: to collect comprehensively both Chinese and foreign books and periodicals covering all subjects; to accept statutory depository copies from all domestic publishers; and to cooperate with other libraries and information centres, in order to enable the Library to become the national library collection centre.
 - b. Promotion: to strive to promote standardization in documentation, adopt centralized cataloguing, compile a national union catalogue, provide bibliographic information to industrial and scientific research workers, in order to make the library known as the national bibliographic centre.

- c. Interlending: to offer services to both Chinese and foreign users through loan, photocopy and microform reproduction, in order to make the Library the national interlending centre." ⁹

The National Library fulfils requests in the traditional manner, by loan, photocopy and microform. 90 % of requests are handled on the day of receipt, and either the item or a response regarding its supply is despatched within 10 days.

- (2) Local cooperation in interlending: This type of interlending, too, is based on voluntary cooperation and is carried out in a rather limited number of major cities. According to incomplete information, it is known that there exists such cooperation at least in Beijing between Qing Hua University Library, the Library of the Academy of Sciences, the National Library of Beijing, etc., and in Shenyang between the Provincial Library of Liaoning, the North-East Institute of Technology Library, the Research Institute of Metallurgy, the Research Institute of Forest Soil, etc.
- (3) Direct application for photocopy: This is already beyond the scope of interlending, but this type of supply service is making a contribution for remote users by providing them with photocopies. The ISTIC and its Chongqing Branch have played a major role in providing these services in China. Other institutions like the National Library also have this function.

3. Problems

From what is known about the performance and organization of interlending activities as they exist in China, a great effort is needed to make improvements in order to establish an effective interlending system in China.

The following points deserve special mention.

- (1) The need for an integrated system: There is a need for an integrated interlending system with coordinating centres under a central coordinating establishment. At present, many major information centres and libraries have not yet been organized into the national or regional interlending systems, let alone the majority of local libraries.
- (2) The need for stimulating the demand for interlending: The existing demand for documents is at a low level, and it conceals the true demand from all potential users. The National Library of Beijing (NLB) has played a major role in interlending activities in China. Nevertheless, the existing activities have not yet attracted many of the potential users, including the large number of scientists and engineers, to use this service.

A number of Chinese scientists and engineers told me that one of the major problems that they had in research and experimental work in China was getting access to the relevant foreign literature, even though they knew where the required material was.

- (3) The need for promoting bibliographic control: The NLB has several types of catalogues, including the National Catalogue of Periodicals in Western Languages and the Bulletin of the National Union Catalogue for Books in Western Languages Newly Received. Therefore, part of the problem for locating the references of titles in foreign languages can be solved. But the Catalogue for Books in Western Languages Newly Received should also be published in a cumulative yearly version. In addition, the regional union catalogues have to be promoted to a greater extent.

The microform format of union catalogues should be developed, instead of the traditional printed form.

- (4) The need for standardized and unified procedures for requests transaction: The procedure is involved in performances of an interlending system, such as satisfaction rate, supply speed and cost. It is necessary to establish a standardized and unified procedure for handling loan and photocopy requests in order to develop an effective service.

In this respect, the NLB has been making efforts to improve the quality of its services. But it seems that much more work has to be done on the standardization of procedures, notably for the cooperating regional libraries and information centres.

- (5) The need for unified transaction for loan and photocopy requests: The loan and photocopy requests should be transacted in the same interlending section. At present, these two types of requests are handled separately by the interlending section and the reprographic section respectively, for instance, in the NLB, thus influencing the performance of the service adversely and hindering performance monitoring.
- (6) The need for manipulation of reference and lending functions of an existing library: For existing libraries and information centres to act as lending agencies, reference and lending functions should be regulated by adopting certain measures, such as acquisition of duplicate items.
- (7) The need for adequate local libraries: Users generally try to make first contact with local libraries. If the local library is inadequate in its collections, or has poor searching tools for references, or has an inefficient service, it will discourage the use of the library.

- (8) The need for library user education: One of many reasons for a low demand for documents is that a great many potential users are unaware of the use of the library or are afraid to use it.

When one proposes or designs a model for an interlibrary lending system in China, it should be kept in mind that China is one of the more advanced developing countries, with enormous development potential in the economic, educational, and scientific and technical areas. In addition to that, its vastness of area, its distribution of industries, communications and transportation, the system of its library and information agencies etc. must be considered.

In China there are a number of major libraries and information institutions with their rich resources of Chinese and foreign collections, such as the National Library of Beijing, the Institute of Scientific and Technical Information of China (ISITC), the Library of the Academy of Sciences of China, the information and documentation centres of the Academy of Medical Science, the Academy of Agricultural Science, the Academy of Social Science, the National Patents Bureau, etc. These should be given the major roles in the interlending activities in China. At the same time, the regional and local libraries and information agencies need to be organized into the regional interlibrary lending network.

In the following proposed model, the priorities are to be given to documents supply in science and technology, with the photocopies designed to meet the majority of demand for interlending.

A proposed model for interlending in science and technology

The proposed model for an interlending system in China can be referred as to a combined pattern with a number of centralized suppliers in cooperation with planned decentralized regional and local systems.

1. Centralized supply by a number of major libraries and information centres at a national level: It is suggested that, in principle, these major institutions, except the National Patents Bureau, only receive requests from the regional and local libraries and information agencies, or from academic and research libraries. The local users should send their requests to their local and regional lending institutions so as to promote those units' capabilities for interlending. The suggested centralized suppliers are:
 - A. The National Library of Beijing: This acts as a lending centre mainly for public libraries to provide foreign documents in science and technology. With regard to Chinese publications, it should be a lending centre for the whole country.

- B. The ISTIC: Apart from anything else, this should function as a national lending centre for foreign documents in science and technology, especially technical reports, conference proceedings, standards and trade catalogues.
- C. The National Patents Bureau: Naturally, this will be a lending centre for patents in the country. This institution is now the only one in China for collecting the patents. Therefore, users can directly request items from it.
- D. The Library of the Academy of Sciences of China: This will be a lending centre for the research institutes of science and technology in the country.
- E. The information and documentation centres of the Academies of Medicine Science and Agricultural Science and Social Science in Beijing: These should be the lending centres in their respective subject areas.
- F. The Ministerial information and documentation centres, such as the Ministry of Geology, Machine Building, Metallurgy, etc. should be the respective lending centres in their specialized fields.

At the same time these major institutions can form a planned decentralized network under the direction of a national coordinating centre.

2. Planned decentralized interlending systems at a regional level: The 6 major regions in the country, which are the northwestern, the northeastern, the northern, the eastern, the central-south and the southwestern regions, should have their planned decentralized interlending systems with their respective coordinating centres. The member lending units of the regional systems are the provincial libraries and information agencies. For example, in the south-western region, composed of the provinces of Sichuan, Guizhou and Yunnan, the member units will be the provincial libraries or information agencies of these provinces with the Chongqing Branch of the ISTIC or a certain provincial library as the coordinating centre. Again, in the eastern region, consisting of the provinces of Jiangsu, Zhejiang, Anhui, Jiangxi and Fujian, the Shanghai Library could be designated as the coordinating centre.
3. Planned local decentralized systems: This type of system is to be set up in each of the provincial capitals since there are major academic and research institutions and major factories located in and clustered around these cities. The other major institutions will be chosen as coordinating centres if the provincial libraries or information centres are already designated as the regional coordinating centres.

The Expected Performance of the Proposed Model

1. According to the available data, so far the satisfaction rate for only foreign periodicals in science and technology can be estimated. The British Library Lending Division has discovered that of its 60,000 current journals, 5,500 are adequate to deal with 80 % of the demand for journals, and 9,000 to cope with 90 %.^{10, 11} In China the ISTIC alone acquired 9,100 titles of foreign periodicals in 1980, and the Chongqing Branch acquired more than 6,000 titles so the expected satisfaction rate for foreign periodicals is expected to be about 90 %.
2. Supply speed: In general, the transportation in China is convenient. All the major cities in China are connected by highways, railways and air routes while all small towns are connected to the major cities by highways. From Beijing to Chongqing, it takes about two days by train or some two hours by plane. From Chongqing to Shanghai, it takes about two and a half days by train, or two and a half hours by plane. Consequently, the supply speed in China is mainly dependent on the efficiency of transaction by the requesting and lending libraries. On average, it may be expected that the supply speed will be in the range of 2 to 3 weeks. As for the local systems, if the request can be filled, the speed will be within 1 week.

Suggestions

In view of the basic features of the proposed system, the present state of interlending in China, some suggestions are made as follows:

1. A national subcommittee or a national coordinating centre for interlending should be set up, together with regional and local coordinating lending centres, in order to draw up the regulation for interlending, to coordinate between related institutions, and to monitor the performances of the system.
2. Training courses or seminars concerned with this area should be regularly held for the administrators and librarians from the institutions of interest.
3. Union catalogues at regional and local levels are necessary. The microform format for catalogues has to be tested and put into use. In addition, the computer-aided union catalogues at a local level, such as in a major city, should be put on trial.
4. A unified interlibrary lending request form has to be designed. The routine procedures should be as simple as possible.
5. Routine statistics for interlending have to be obtained in order to monitor the performance of the system.

6. The photocopy facilities have to be improved. The existing interlending service should be combined with the photocopy service.
7. The interlending service does not and will not substitute for the services of local libraries. The relevant administration should pay attention to promoting the resources and services at local libraries.
8. The postal expenses for interlending should be waived for individual users.
9. Comparison between the interlending services and the direct document delivery services should be made in a detailed way, because of the widely-existing document copy delivery services of the ISTIC and its Chongqing Branch, the NLB, etc.
10. Special attention has to be given to the impact of new technology on the traditional structure of interlending.

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THE CEC'S ROLE IN THE PROMOTION OF ELECTRONIC DOCUMENT DELIVERY IN EUROPE

Carlo Vernimb

Commission of the European Communities, Luxembourg

1. Introduction

The online information market can be looked upon as developing in (overlapping) phases:

- Phase 1 - a market for bibliographic references in electronic form to printed documents. There were 50 000 online searches, in 1983, in Europe (compared with 500 000 in the USA). Euronet offers access to 500 online databases, of which 250 are bibliographic.
- Phase 2 - a market for electronic documents.
Ten pilot experiments on electronic document delivery and electronic publishing are being carried out in 1984/1985 with CEC support.
- Phase 3 - a market for electronic information, as contained in factual databanks and in videotex systems. Applications of videotex with CEC support are being planned for Ireland, Italy and Greece.
- Phase 4 - a market for "electronic knowledge", e.g. query answering systems.

The CEC initiated Euronet and supported the creation and improvement of databases accessible through Euronet. These activities strengthened the European market for electronic bibliographic references. Realizing the limitation to references, the CEC initiated an action programme, the so-called DOCDEL Programme, for electronic document delivery and electronic publishing^{1, 2, 3, 4} in the framework of which preparatory studies^{5, 6, 7, 8, 9, 10, 11, 12} have been commissioned and 10 pilot experiments are being carried out.

2. The 10 DOCDEL Experiments

After two years of preparatory work comprising studies and consultations the Commission launched a Call for Proposals, in November 1982, for the experimental development of new integrated systems for electronic document delivery and electronic publishing.

Declarations of interest were received from 150 organisations within the Community. The declarations culminated in May 1983 in twenty-seven proposals for full-scale experiments, at a total cost of 21.6 million European Currency Units (MECU) of which the Commission was asked to provide 5.6 M ECU. Following a series of evaluations and consultation with the member countries, it was decided to select a set of ten experiments because of the expected catalytic impact they would have on the market, and on account of the assurances which they provided concerning technical feasibility, project management, the provision of appropriate document sets and the organisation of evaluation procedures. Their total cost is 16.1 M ECU to which the Commission contributes 3.6 M ECU (22 %).

Each experiment should:

- cover all the functions necessary to provide a complete electronic document delivery service or electronic publishing operation : creation, identification, ordering, retrieving, transmitting and invoicing, among others as well as the functions necessary to feed the service itself : full text capture, storage, etc.
- be open to a wide - preferably international - user community
- be on a sufficiently large scale to test user acceptability
- be run over a long enough period to collect operational data on cost, reliability, creation and updating of the document store and management of the whole collection of documents in the store as well as on user acceptance.

In view of the variety of technical, economic and organisational options which are open to the experiments, it was not intended that they should compete with each other to discover the "best solution". It was felt that their impact would be maximised if the experiments were complementary and formed a cohesive package which covered the main areas of interest as far as possible. The principal areas were defined in the Call as:

- electronic document delivery, where existing stores of printed documents can be converted in toto or on demand for electronic transmission;
- electronic publishing, where documents are generated in electronic form by authors;
- the handling of graphics and extended character sets such as mathematical notation and symbols in a standardised manner;

- invisible colleges, where grey literature, draft notes and annotations can be circulated freely amongst peer groups.

The ten experiments will run over 1984 and 1985.

The Contracts were signed during the first months of 1984.

There are three projects in the area of electronic document delivery;

- TRANSDOC, led by CNRS (Centre national de la recherche scientifique), France, will upgrade the existing manual document delivery service for a bibliographic data base on French patents for 100 biomedical journal titles and for grey literature (reports) on electrical research. The project will compare the use of digital optical disc and automated microfiche cabinet as storage media. (See article by Soulé, in this issue of IATUL Proceedings).
- Electronic Publishing of Patent Information, led by FIZ 4 (Fachinformationszentrum Energie, Physik, Mathematik), Germany, will create a new data bank of German patents, including line drawings and chemical formulae, as well as bibliographic references. An important innovation in this project is the high compression of line drawings, which will allow their storage on the same magnetic disc as the other elements of the patents. Users will be able to choose between cheap videotex receivers and sophisticated text and graphics terminals. (See article by Tittlbach, in this issue of IATUL Proceedings).
- Eurodocdel, led by Europe-Data, Netherlands, will make European Community documents available to European Documentation Centres and other interested groups throughout the Member countries. The storage medium chosen is magnetic disc, and later digital optical disc. Document location and ordering will be made possible by a user-friendly videotex service in Luxembourg which can be accessed via public data networks.

These three experiments aim to make over one million pages of documentation available to user groups which will provide systematic feedback on the service. Each proposer has formed a consortium including publishers, computer service bureaux, computer equipment manufacturers and documentation centres which provide user groups.

In the area of electronic publishing, four experiments will be carried out:

- The Electronic Magazine (Learned Information Ltd., UK), will enable 12-17 authors in different countries to compose articles about information science on word

processors, and transmit the texts to a central computer via public data networks. The texts will be refereed and edited by the publisher, then made available in the form of an electronic journal to users throughout the world. In this way, the magazine can be updated 2-3 times per week.

- The project "Electronic Journals in Chemistry", led by Royal Society of Chemistry, UK, will place two journals on chemical research on an online service. Unlike other experiments in this area, the system will accept text from different kinds of word processors and will handle graphics.
- The Commissariat à l'Energie Atomique, France, will place a mathematical journal online. This experiment will examine closely the problem of coding mathematical notation, and will provide authors with a simple procedure to enter text and equations into the system.
- VNU, a publisher based in the UK and the Netherlands, will publish two electronic newsletters, in the fields of information technology and the information industry. The distribution approach will favour the electronic version, although printed copy will be available. Each newsletter will be published in daily issues to a wide international population of terminal users, through an online host and public data networks.

The elements of novelty in these experiments lie in the lack of a paper chain, the widespread location of users, rapid updating and rapid refereeing. Sophisticated retrieval software which combine menu and keyword searching will allow easy browsing and reading of material.

These experiments will make approximately 8000 pages of text available, to at least 800 users, for the duration of the experiments. Although it is currently on a smaller scale than the electronic document delivery projects, the electronic publishing of journals is expected to take precedence in the future.

Two experiments set out to solve common problems to both electronic document delivery and electronic publishing.

- An experiment by Verlag Technische Regelwerke (Federal Republic of Germany) will devise standardised methods for handling complex texts and difficult character sets within an electronic publishing system.

The experiment will include research into workstation characteristics, in particular the trade-off between equipment cost and user acceptance. The standardisation of

storage formats will enable small publishing businesses to enter the electronic publishing arena. The experiment will include the creation of an "electronic publishing laboratory" where small and medium-sized enterprises can test the system which is created.

- Mondadori, a publisher in Italy, will create a system which will reduce the costs of printing low volumes of scientific documents.

The development of electronic invisible colleges was identified by the Commission as a mechanism for the rapid circulation of grey literature and pre-published material.

- A proposal by the National Institute of Higher Education (Ireland) matches this requirement.

It will link over thirty higher education institutes in three countries with different kinds of microprocessors, via public data networks such as Euronet.

The network will allow the rapid interchange of draft notes, curricula, archives and other grey literature, including the proceedings of conferences. 3600 documents are foreseen. It is expected that the experiment will demonstrate solutions to the inherent technical and organisational problems of creating an international micro-processor network with heterogeneous hardware and different tele-software and office automation packages.

These descriptions hardly do justice to the comprehensive aims and implications of the ten experiments.

Neither can the following statistics fully represent all aspects of the programme which covers:

1.2	million pages (text and graphics)
8-12 000	end users
150	man-years development work
35	companies and organisations within the
10	consortia, four of which are led by private publishers

These DOCDEL activities and a planned Second Docdel Programme for the years 1986/87, will, hopefully, lead to a European market for electronic full text documents. However, there is at least one obstacle: We lack an appropriate transmission system. The terrestrial telecommunication means of today are too slow, too expensive and not reliable enough for electronic document delivery.

3. APOLLO

Consequently the CEC carried out some market investigations^{13, 14} and turned to the European Space Agency (ESA), joined forces with EUTELSAT and the Permanent Nucleus of CSTD/GTD of CEPT, produced together the APOLLO Concept¹⁵ which would make use of the Satellite Multiservice System of the second flight unit of the European Communication Satellite (ECS-2/SMS), and presented the concept on 19 April, 1983 to interested PTTs. They accepted in principle and enriched the APOLLO Working Group by their experts. This Group adopted on 4 July 1984 the APOLLO Draft System Requirements Specification¹⁶ which includes also small receive-only earth stations.

ESA will be responsible for technical developments and the Commission for the coordination of APOLLO applications. The Commission will organise one of the applications (with Community documents), British Library Lending Division will organise another application, and others are likely to follow. The first services are likely to start in 1986.

The Commission's involvement in the programme would put her in a better position with regard to discussions on access procedures, tariff structures etc.

In order to attract user groups such as libraries and documentation centres the CEC intends to make available a number of receive-only earth stations and to publish a Call for declarations of interest for participation - as a user - in APOLLO.

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ONLINE RETRIEVAL AND ELECTRONIC DELIVERY OF GERMAN PATENT INFORMATION

Gerd Tittlbach

Fachinformationszentrum Karlsruhe, Federal Republic of Germany

1. Objectives and User Demand

Patent information is indispensable for scientific and technical information transfer, technology transfer, and innovation. Publication of an invention at an early stage furthers technical progress; in return, the owner of the patent claim is granted a temporary exclusive right to the invention. We can thus state that patents have a dual function, i.e. an information function and a protective function.

In consequence, quick access to patents and other relevant publications in science and technology is a basic prerequisite for efficient utilization of the available know-how and for technical innovation. This is the goal of a pilot project on electronic publishing, dissemination and delivery of patent information, carried out with financial aid of the EC Commission and the German Federal Government.

Patent publications consist of a structured text supplemented by drawings (see Fig. 1, title page of a patent application). The text comprises:

- . application data and data on the legal status of a patent
- . an abstract
- . the patent claims
- . a technical description
- . a state-of-the-art review

The drawings and other graphical representations, e.g. chemical structures, provide additional information for an assessment of the applicant's protective rights and of the technical features of an invention.

19 BUNDESREPUBLIK
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PATENTAMT

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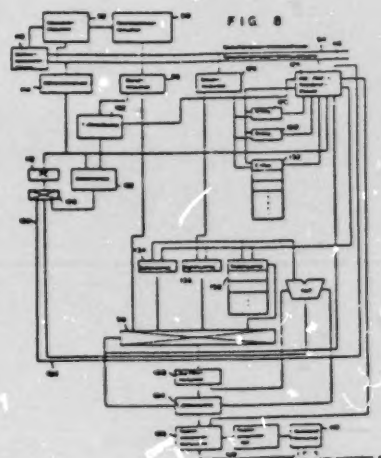
17 Erfinder:

Matsumoto, Yoshihiro, Tokyo, JP; Kurii, Hajime, Wako,
Saitama, JP

Prüfungsantrag gem. § 44 PatG ist gestellt

18 Sprungabschätz-Zentraleinheit

Bei der erfindungsgemäßen Sprungabschätz-Zentraleinheit zur Ausführung eines Sprung- bzw. Verzweigungsbefehls wird ein Vorsignalisierbefehl zur Bezeichnung einer Sprung- bzw. Verzweigungsadresse durch eine Adressenvorabruf-Steuerungsschaltung (124) im voraus abgerufen, bevor der Sprung- bzw. Verzweigungsbefehl aus einem Makrobefehlsspeicher ausgelesen wird. Dieser Vorsignalisierbefehl wird dekodiert. Die Verzweigungsadresse wird im voraus in einem A-Register (128), einem B-Register (130), und einem C-Stapelregister (132) gespeichert. Eine Anzahl von an den durch diese Adressen dargestellten bzw. bezeichneten Speicherplätzen gespeicherten Befehlen werden in einem ersten Befehlsregister (134), einem zweiten Befehlsregister (136) und einem Registerstapel (138) gespeichert, bevor der Sprung- bzw. Verzweigungsbefehl ausgeführt wird. Bei der Ausführung der Verzweigungsbeehle kann die Steuerung ohne Gefährdung des Pipelinesystems auf Sprungspeicherplätze (jumped locations) umgeschaltet werden. (31 16 100)



DE 31 16 100 A 1

BUNDESDRUCKEREI BERLIN 03 87 738 014 553

27/79

Fig. 1 Title page of a patent application

The above-mentioned project intends to facilitate improved access to the millions of pages of patent publications:

- by setting-up a national German Patent Data Base containing both text and graphical representations
- by making this data base accessible to the professional community via computerized information services, i.e.
- by providing online access via the public telecommunication networks, including crossfile-searching in further scientific and technical data bases
- by SDI services
- by statistical evaluations, etc.

The dual function of patent information makes it interesting to a broad user spectrum, for example

- Patent Offices

- German Patent Office
 - European Patent Office
 - other national Patent Offices

- the public

- patent and information departments of industrial companies
 - small and medium-sized enterprises
 - patent agents
 - technology transfer agents, innovation consultants
 - chambers of commerce and trade
 - university institutes, research centers

A preliminary, small-scale user and market study among others had the following results:

- Patent searching by conventional means requires 6 to 10 h per search, depending on the type of search. If searches are carried out by external experts, the cost per search amounts to DM 700 to DM 1,400.
- Most of the a.m. user groups have expressed their need for, and interest in, a German Patent Data Base. This applies in particular to those institutions that do not have their own patent documentation departments.
- Apart from direct access to the bibliographic data (on the application and the legal status), access to technical data, facts, contents, patent claims, major drawings, and the complete document is of particular interest to the users.

- Other demands are: Patent documentation as far back as possible, and the possibility of combined searches in other patent data bases as well as in s/t bibliographic and numerical databases.

2. Technical Concept, Project Management, Information Services

The latter two tasks have already been tackled without financial aid from the EC, by making available the machine-readable data of the German Patent Office, including back issues, and by choosing an efficient host and data base supplier. The Fachinformationszentrum Karlsruhe has considerable experience in text processing and in host services. Together with other data base suppliers, the Fachinformationszentrum now offers online access to some 50 bibliographic and numerical data bases. The data bases can be used at present via the INKA Online Service and in the future via STN International, including the possibility of cross file searching and online ordering. Full-text data bases with an efficient and user-friendly retrieval system are being envisaged. As a first stage of online access to the German Patent Data Base early in 1985 the bibliographic data, dating back to 1973, and abstracts, dating back to 1981, of the German patent publications (Offenlegungsschriften, Auslegeschriften, Patentschriften) as well as of applications for utility models will be made available.

New technical developments to be implemented under the Docdel project, funded in part by the EC Commission, are:

- combined storage of text and graphical representations in one data base
- digitizing of drawings and conversion of the data into vector graphics output format
- combined transmission of text and graphics via the public (narrow-band) telecommunication networks to different types of terminals

The consortium charged with the pilot project consists of:

the German Patent Office, Munich

Satz-Rechen-Zentrum Hartmann & Heenemann, Berlin

Gesellschaft für Information und Dokumentation, Frankfurt

Fachinformationszentrum Energie Physik Mathematik, Karlsruhe

The Fachinformationszentrum is the consortium and project leader.

The tasks have been distributed as shown in Fig. 2:

PATENT INFORMATION SYSTEM

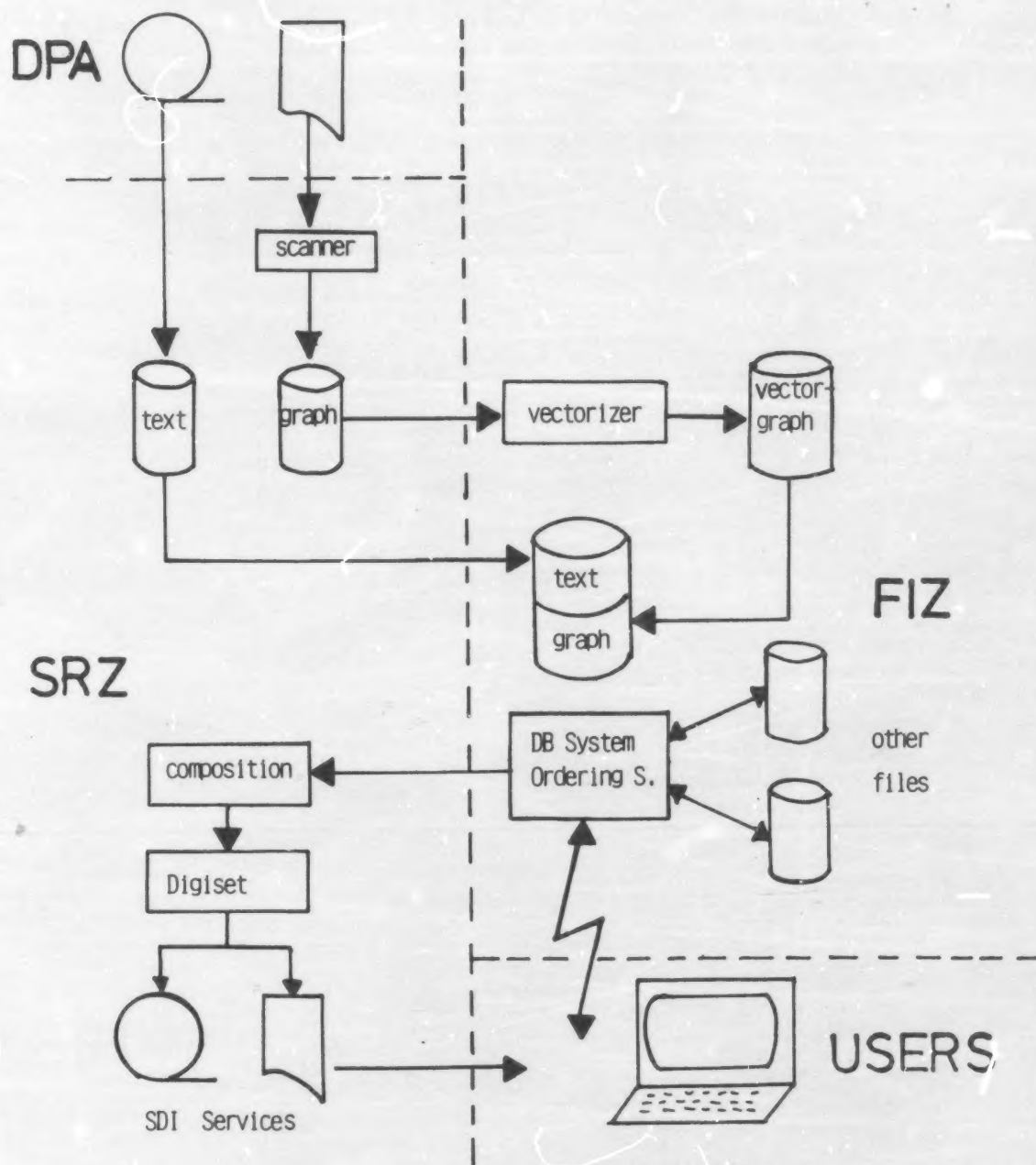


Fig. 2 Patent information system

The German Patent Office provides the text data of the title pages of patent publications as well as data for classification and documentation, both in machine-readable form.

The Satz-Rechen-Zentrum processes these text data for input into the data base; it supplements the text with digital information of the major technical drawings and by facsimile representations of chemical structures and complex mathematical formulas.

The Fachinformationszentrum uses these data to set up a continuously updated pilot patent data base with text and graphical information and offers this data base for online access. File design and patent formats will take into account all search possibilities specific to patent publications. Formats will be designed along the lines of the INPADOC formats. The data base will be in German, but foreign users will be offered scope notes and keywords of the International Patent Classification in English and French. The data base will utilize the STN Base Software "Messenger". The data will be stored on magnetic disks; copying of the display files on digital optical disks will be possible if greater storage capacity is required.

The Satz-Rechen-Zentrum will also offer SDI services in printed and machine-readable form, first via their own data base, later via connection to the FIZ host computer.

The Gesellschaft für Information und Dokumentation will carry out a number of studies in association with the project, especially on user acceptance and economic aspects.

Once the problems connected with processing, storage, transmission and display of text and graphical information have been solved for the title page of patent publications, electronic delivery of the complete patent documents will pose no further basic problems, but design and retrieval problems. In the final project phase, a small-scale test data base with full-text of granted patent publications will be set up.

Information services for the public will thus be extended in every project stage:

- . January 1984: Patent SDI services in printed form, from mid-1984 onwards also in machine-readable form
- . February 1985: Online access to the Patent Data Base, including searching in bibliographic data and abstracts, cross file-searching in other data bases, and online ordering of the printed full text
- . Mid-1985: Integration of the digitized and converted graphical information of the title pages of patent publications into the data base and combined transmission and display of text and graphics
- . End of 1985: Operation of a test data base, including online access, with full text of granted patent publications.

3. Developments in Information Techniques

In contrast to all other projects of the Docdel programme of the EC-Commission, this project will be based not on facsimile transmission but on a novel concept for storage, transmission and display of graphical information. The main developments in this field are:

- . conversion of graphical information from the raster graphics of the scanner into a vector representation, and
- . terminal interfaces to support all commercially available types of terminals for combined transmission and display of text and graphics

The drawings are digitized using a laser flat-beam scanner with a resolution of at least 160 lines/cm. Patent drawings consist mainly of straight lines and curves of defined curvature; this makes vector graphics a feasible alternative to raster graphics. High data compression can be achieved, e.g., by center lining, coding of line thicknesses, partial pattern recognition, and the possibility of post-editing. The main advantages of this technique, however, are in storage and display. The vector format renders data storage independent of the resolution of the terminal. On the terminal sector itself, there is a clear trend towards intelligent terminals with a processing function for graphical information. Using relative coordinates for the vectors, this technique allows display of the complete drawing on a single screen. In the same way, zooming is possible without loss of information. Vectorisation further permits postprocessing of drawings and storage via vector graphics aids. Re-conversion into raster graphics is possible via bitmapping, so that normal raster terminals and printers can also be used. At the present technical level of programs and hardware elements available in Europe and the USA, the vectorisation technique appears, in principle, to be feasible.

Terminal support is another central field of development within this trial. The project aims at developing additional adapted software for different terminal operating systems for electronic information transmission (displaying, downloading etc.), especially for terminals that are expected to have a big market share in the future or terminals that offer high comfort in post-processing of data. At the present state of knowledge, high-resolution terminals are best suited for graphical representations, but great interest is also taken in various types of personal computers. The suitability of the Gtx service (interactive videotex) of the Deutsche Bundespost for using the patent information system will also be examined in the course of the development.

Summary

The objective of the project is to develop and set up a German patent database with textual and graphical information and to offer this database to the professional community by various computerized information services, especially by online access via

public telecommunication networks. The novel feature will be the combined digital storage of text, graphs, chemical structures and mathematical formulas in one database, and the making of this information available for information retrieval and delivery. Text data are recorded by keyboarding or by OCR-printer, drawing complex formulae etc. by an optical laser scanner. The storage and transmission of the digitized graphical information is to be carried out in vector graphics which promises high compression of the data to be stored, and independence from the resolution capacity of the terminals. All types of terminals will be supported for transmission and display of text and graphics, including the extending market of personal computers.

The project is jointly carried out by a consortium consisting of the German Patent Office, the Satz-Rechen-Zentrum Hartmann + Heenemann, the Gesellschaft für Information und Dokumentation and the Fachinformationszentrum Karlsruhe as the consortium leader. The patent information database will be set up for online access step by step. A broad spectrum of users is expected and involved in the project including national and international patent offices as well as the public with the patent departments of the industry, small and medium-scale enterprises, chambers of commerce, patent agents, technology transfer agencies etc.

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REF-ED: A SYSTEM FOR PRODUCTION OF REFERENCE LISTS IN MANUSCRIPTS ALLOWING DOWNLOADING FROM LARGE DATABASES

There are today several excellent systems available for information retrieval of bibliographic references using large computer systems. While many existing systems are very powerful tools in the hands of educated specialists for searching in large databases, very few can assist in the production of manuscripts. The usual result of a database search is a printout with a list of references. In the highly likely event that the scientist who ordered the computer search is going to use at least some of the references in the production of a manuscript, the information has to be retyped manually.

REF-ED is a system of programs for microcomputer systems, developed by BIOSOFT Sweden, for the solution of these problems. It is a database system for the individual investigator allowing easy automatic restyling of the bibliographic information. The format specifications may be tailored by the user to suit almost any reference style.

The REF-ED system may be used for the organization of a personal reference bank and as a complement to wordprocessing. It includes powerful editing functions, and the search functions, allow string searching of all fields and a combination of search words with AND/OR. Special keywords may also be assigned to facilitate retrieval.

The most interesting feature of this program, however, is the possibility of downloading references from certain very large databases with bibliographic information. The first implementation was on the ELHILL system by NLM, Washington DC, with MEDLINE, which covers about 4000 medical journals, as the most prominent base. An interactive user connected with his microcomputer may search the large database and save the found references locally. Off-line, a special program converts the printout from e.g. MEDLINE to the internal database format allowing local search and automatic reformating. This conversion also performs certain steps necessary for the later production of manuscripts, such as adding periods to indicate abbreviated journal names, converting upper-case characters to lower-case and vice versa.

At present, interfaces to a number of large non-medical bibliographic databases are being developed. In most cases this should be no major problem and Biosoft is interested in requests for specific systems.

Machine requirements: The REF-ED system is currently available for a large number of microcomputers systems. For 16 bit micros operating under MS-DOS such as the IBM-PC, DEC Rainbow, Sirius and Apricot, and for 8 bit microcomputers operating under CP/M-80, such as Cromemco, Altos, TeleVideo and even Apple II and BBC micro with Z80 cards. Some versions for dedicated wordprocessors also exist. A version for the VAX and PDP11 minicomputers is being developed.

For more information please contact:

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TRANSDOC - AN ELECTRONIC DOCUMENT TRANSMISSION PROJECT AT C.D.S.T.

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This article will give an outline of TRANSDOC - the electronic document transmission project planned by the Centre de Documentation Scientifique et Technique (C.D.S.T.) of the Centre National de la Recherche Scientifique, Paris. The information services and products provided by the C.D.S.T. for the worldwide scientific community are described in a brief introduction.

1. The information services products provided by the Scientific and Technical Documentation Centre (C.D.S.T.) of the C.N.R.S.

To have an idea of the research worldwide on a particular subject, to obtain information on a technique quickly, to be kept regularly informed on changes in knowledge in a given sector, or to select the most important publications amongst the 500 million pages published every year, these are difficult for an individual to do! However, it is part of the daily routine of an organization such as the C.D.S.T.

The C.D.S.T. collects scientific and technical literature, mostly periodicals, from 77 different countries. Areas covered concern the Exact Sciences, Life Sciences, Earth Sciences and Technology. The C.D.S.T. is able to offer a number of services and products in reply to the information requirements of researchers, students, industrialists and engineers using its documentation sources.

DOCUMENT SUPPLY SERVICE enables access to primary documents: 20 000 periodical titles (of which 13 500 are current publications), 19 000 scientific reports, 76 000 theses (French) and 27 000 conference proceedings. Thus, it becomes possible to obtain a whole article on micro-film or as photocopies using the Standard Service, 5 days + postage time, or the Fast Service, 48 hours + postage time. If the documents required cannot be found at the C.D.S.T., the Centre will search for it in the 100 libraries it collaborates with.

THE TRANSLATION SERVICE translates scientific and technical texts from all foreign languages into French and vice versa. Translators specialised in the subjects concerned undertake this work.

Since 1973, the C.D.S.T. offers ON-LINE ACCESS TO THE PASCAL FILE. PASCAL includes 5 million bibliographic references divided since 1984 into 2 types of complementary files:

Multidisciplinary PASCAL, concerning the basics of world literature, (the 4200 periodicals considered to be the most important). Sectorial PASCAL a unit containing 11 data bases, giving exhaustive coverage (using a greater number of periodicals) in sectors such as: welding-brazing, metals-metallurgy, buildings-public works, biotechnology, food industries, oncology, etc. ...

Documentary search can be carried out with the use of PASCAL:

- . Retrospective bibliographies enabling coverage of a given topic since 1973.
- . Profiles, corresponding to selective diffusion of information. Each month a bibliography is published of the recent articles concerning a given subject. There are 2 types of profile: 300 Standard Profiles, determined by the C.D.S.T., and Personalized Profiles, defined by the user.

Using PASCAL, there are also 4 categories of monthly bibliographic publications which are adapted to both user needs and subject specificity. For example, in the area concerning technology and the exact sciences, there are:

SIGMA: concerning the exact sciences, technology and life sciences.

3 volumes which enable regular follow-up of the state of knowledge in these sectors:

THEMA: reflecting the 11 sectorial and exhaustive data bases.

FOLIO and EXPLORE: giving regular information on precise and topical subjects. For example: Lasers, Computing, Videodetection, Water, Air and Soil Pollution, Plant Biology, Genetics and Neurology ...

For a complete list of C.D.S.T. publications and for any additional information, contact:

C.D.S.T.
Service Promotion - Commercialisation
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26, rue Boyer
75971 PARIS CEDEX 20
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2. General description of the TRANSDOC project

The project involves planning, developing and testing a system offering the following facilities:

- storage of scientific and technical information held on paper and possibly digital media (i.e. magnetic tape):
 - in compact form, on digital optical disk and magnetic disk
 - in non-compact form, on microfiche.
- linked usage with several internationally available data bases, using different networks.

After a bibliographical reference has been obtained from whatever source (e.g. data base, libraries, abstract journal, etc.), an on-line order will be automatically recorded with full details.

Depending on certain technical conditions (e.g. whether or not the user has access to an appropriate terminal, and whether or not there exists a full document which tallies with the reference) and certain economic criteria, the required document may be restituted either immediately or off-line.

For the experimental phase, several types of document delivery have been envisaged, and can be introduced as and when transmission standards and the requisite hardware become available, e.g.:

- By post: This will be the first solution used. The document requested will be printed electronically* where it is stored, and then sent to the requester. The same procedure will be adopted for documents indexed in the data bases but not stored in the system.
- By telecommunications
 - On a local network: The document will be displayed on a high-definition screen and can be hard-copied on a printer.
 - Remote:
 - initially by using G III telecopiers on the switched telephone network;
 - at a later stage, by specific terminals (e.g. batch terminals or mixed-mode teletex machines) or on G IV telecopiers using public packet switched networks (e.g. Transpac and Euronet), given appropriate norms (i.e. an Architel-type protocol and high-networks (ultimately ITDN and ISDN).
 - possibly on wideband networks.

* by Laser printer

3. Technical description

The system may be broken down into a number of parts.

3.1 Document storage facilities

- . Automatic-access microfiche device, digitization in conjunction with actual use of the document requested.
- . A set of digital optical disks.
- . One or more magnetic disks.

3.2 Document access equipment

- . A computer will be used to look after the logical reference/physical storage location interface (i.e. identifying the document storage address).
- . This computer will receive information on the logical reference in two ways:
 - either by direct input, using an interactive input station
 - or by the host, the reference being the result of a bibliographical search in a data base.
- . This computer will be used to search for the information on the medium concerned.

3.3 Linking facilities

One part of the system - software and hardware - will be designed to:

- . establish a direct link with a publisher by magnetic tape (so that, in 1984, the system will be available to consult patents input by word processor at the European Patents Office).
- . establish a link with the host, giving access to bibliographical references.
- . establish telecommunications links with users
 - to accept orders
 - for immediate reception of documents.

The system will have to be transparent in terms of hosts and networks selected, and in particular it will have to be accessible via the EURONET network.

3.4 Document indexing

As the volume of material input may be fairly large (2500 pages per day), an automatic reference recognition system will be developed, using an optical device linked to the digitization system.

3.5 Management functions

The system will keep track of all transactions for accounting purposes (customers and producers), for statistics and for copyright processing.

4. Description of the system from the user's point of view

A study will be carried out with a view to evaluating the service offered, based on a sample of users chosen in 1984. This follow-up to the experimental phase will involve internal methods (i.e. statistics) and external methods (i.e. surveys).

The volume of processing work is as follows:

CDST	= 28000 articles	210 000 pages/annum
INPI	= 17000 patents	290 000 pages/annum
EDF	= 3000 articles	96 000 pages/annum

5. The participants

The feasibility, the development conditions and the specific details of the project have been under study since the beginning of 1983, and the project itself is based on the following:

- . producers/disseminators
 - CNRS/CDST
 - the Institut National de la Propriété Industrielle
 - the research and study section of EDF
- . a host centre linked to national and European networks (TELESYSTEMES-QUESTEL in Valbonne, France)
- . internationally operational data bases, i.e. PASCAL, EDFDOC, INPI 1, INPI 2
- . publishers, via the Association pour la Promotion de la Presse Médicale Française (APPMF)
- . users:
 - a group of biochemistry researchers in Rhône-Alpes (Lyon)
 - a group of users from the medicine faculty library at the Catholic University of Louvain
 - the European Patents Office in The Hague
 - documentation teams in EDF research centres.

6. The options

The technical options in the project were determined by the following considerations.

- The connection and management hardware exist on the market, and the requisite software constitutes a limited investment.
- Information input equipment exists and is usable in practical terms.

Digitization: A4 digitizers
microfiche digitizers

Micrography

Indexing

- Restitution equipment (i.e. high-definition screen, laser or electronic printer, G III telecopiers) are or will become operational within a reasonable period.
- Automatic microfiche search systems with digitization, along with digital optical disk systems, are under development and will take some time to perfect.
- The telecommunications equipment will take longest to set up, as it will have to comply with the OSI seven-layer architecture, and be based on public data transmission networks (whether or not in batch mode).

They are therefore dictated by international standards which are still being drawn up by the relevant international organizations (e.g. ITTCC), more particularly as regards document level and draft document Tb for G IV telecopiers, where the standard is expected in mid-1984.

In the case of local networks (baseband and wideband), any project depends on the appearance of standards which are currently being drafted (e.g. IEEE 802) for the lower levels of the ISO architecture (standards expected in mid-1984).

7. Development plan

The experiment is divided up into a number of phases to facilitate modular and coordinated development, and so that progress can be made pending the development and supply of both hardware and software.

The project started in January 1983 and will continue up to the end of 1985.

The main stages are:

- 1983: Response to the EEC's DOCDEL Proposals.
Elaboration of the technical specifications.
- 1984: Software production.
Purchase of equipment.
Start of experimentation.
- 1985: Evaluation of the system by users.